J. Behav. Ther. & Exp. Psychiat. 42 (2011) 423–431

Contents lists available at ScienceDirect

Journal of Behavior Therapy and Experimental Psychiatry

journal homepage: www.elsevier.com/locate/jbtep

EMDR and mindfulness. Eye movements and attentional breathing tax working memory and reduce vividness and emotionality of aversive ideation

Marcel A. van den Hout*, Iris M. Engelhard, Daniel Beetsma, Christien Slofstra, Hellen Hornsveld, Jan Houtveen, Arne Leer

Clinical and Health Psychology, Utrecht University, PO Box 80140, 3508 TC Utrecht, The Netherlands

ARTICLE INFO

Article history:
Received 18 November 2010
Received in revised form
14 March 2011
Accepted 24 March 2011

Keywords:
Aversive memories
Trauma
EMDR
Eye movements
Working memory

ABSTRACT

Background and objectives: Eye Movement Desensitization and Reprocessing (EMDR) and Mindfulness-Based Cognitive Therapy (MBCT) are effective in reducing the subjective impact of negative ideation. In both treatments, patients are encouraged to engage in a dual-task (eye movements (EM) in the case of EMDR and attentional breathing (AB) in the case of MBCT) while they experience negative thoughts or images. Working memory theory explains the effects of EM by suggesting that it taxes limited working memory resources, thus rendering the image less vivid and emotional. It was hypothesized that both AB and EM tax working memory and that both reduce vividness and emotionality of negative memories.
Methods: Working memory taxation by EM and AB was assessed in healthy volunteers by slowing down of reaction times. In a later session, participants retrieved negative memories during recall only, recall + EM and recall + AB (study 1). Under improved conditions the study was replicated (study 2).
Results: In both studies and to the same degree, attentional breathing and eye movements taxed working memory. Both interventions reduced emotionality of memory in study 1 but not in study 2 and reduced vividness in study 2 but not in study 1.
Limitations: EMDR is more than EM and MBCT is more than AB. Memory effects were assessed by self reports.
Conclusions: EMDR and MBCT may (partly) derive their beneficial effects from taxing working memory during recall of negative ideation.

© 2011 Elsevier Ltd. All rights reserved.

1. Introduction

Some 20 years ago, EMDR was introduced as treatment for posttraumatic stress disorder (PTSD), and meta-analyses of effect studies have concluded that the therapeutic claim was justified. EMDR appears to be as effective as cognitive behavior therapy (CBT) and the therapeutic effect is substantial, at least as large as those of other established treatments for other anxiety disorders (Bisson et al., 2007; Bradley, Greene, Russ, Dutra, & Westen, 2005; Seidler & Wagner, 2006). An early meta-analysis concluded that the eye movement component does not contribute to the effects of EMDR (Davidson & Parker, 2001). However, it has been criticized on methodological grounds (Lee & Cuijpers, submitted for publication), and a recent more encompassing and rigorous meta-analysis did find significant additive effects for eye movements in clinical trials (Lee & Cuijpers, submitted for publication).

To explain EMDR effects, various authors have modeled EMDR, especially the eye movements (EM) component, experimentally. Typically, healthy participants are first asked to retrieve aversive autobiographical memories and rate their vividness and emotional valence. Then they are asked to recall the memories while making EM or doing no-dual-task (recall only). Finally, after recall + EM and recall only, participants are asked to recall the memories again, and to rate vividness and emotionality once more. Studies have shown that recall + EM reduces vividness and emotionality, but recall only does not (Andrade, Kavanagh, & Baddeley, 1997; van den Hout, Muris, Salemink, & Kindt, 2001; Kavanagh, Freese, Andrade, & May, 2001; Barrowcliff, Gray, Freeman, & MacCulloch, 2004; Kemps & Tiggemann, 2007; Maxfield, Melnyk, & Hayman, 2008; Gunter & Bodner, 2008). Apparently, the EM component of EMDR can be modeled under laboratory conditions, opening the door for the experimental dissection of the psychological mechanisms responsible for the treatment's therapeutic effects.

* Corresponding author. Tel.: +31 30 2531470; fax: +31 30 253 7482.
E-mail address: m.vandenhout@uu.nl (M.A. van den Hout).

0005-7916/$ – see front matter © 2011 Elsevier Ltd. All rights reserved.
doi:10.1016/j.jbtep.2011.03.004

A fresh explanation of how EM might work has been derived from working memory theory (Andrade et al., 1997). The theory entails that retrieving a memory for an event requires limited-capacity working memory (WM) resources. If a secondary task is executed during retrieval that shares this dependence, fewer resources will be available for recalling the memory, and the latter will be experienced as less vivid and emotional. EM are held to serve as such a 'secondary' task that taxes WM, reduces vividness during memory recall and affects later recall (van den Hout et al., 2001; Kavanagh et al., 2001; Barrowcliff et al., 2004; Kemps & Tiggemann, 2007; Maxfield et al., 2008; Gunter & Bodner, 2008). The notion that the vividness of future recollections can be affected by the nature of earlier recollections is not new. If individuals concentrate on mental imagery, vividness of future recollections increases substantially (e.g., Hyman & Pentland, 1996). While such concentrated mental imagery creates "imagination inflation", cognitive taxing during recall seems to do the opposite and deflates the vividness and emotionality of future recollections. EMDR seems to therapeutically exploit the fact that memories become labile during recall and that reconsolidation is affected by the nature of the recall (Baddeley, 1998).

This WM account of the EM component of EMDR comfortably fits with experimental data. Non-taxing secondary tasks, like simple finger tapping, do not have beneficial effects (van den Hout et al., 2001), while more complex tapping does (Andrade et al., 1997). During EMDR eyes are typically moved horizontally. In line with a WM account, moving eyes vertically is just as effective (Gunter & Bodner, 2008). Crucially, the same effects occur if WM is taxed during memory recall with non-EM secondary tasks, like auditory shadowing (Gunter & Bodner, 2008), drawing a complex figure (Gunter & Bodner, 2008), doing arithmetic (Kemps & Tiggemann, 2007; van den Hout et al., 2010; Engelhard, van den Hout, & Smeets, 2011), or playing the computer game 'Tetris' (Engelhard, van Uijen, & van den Hout, 2010b). In these studies, participants deliberately recalled the negative memory during the dual-task. In two studies, participants played Tetris for 10 min following an interval of 30 min (Holmes, James, Coode-Bate, & Deeprose, 2009) or 4 h (Holmes, James, Kilford & Deeprose, 2010) after seeing a film of traumatic content. Before playing Tetris, they had a reminder of the film. Both experiments showed that, relative to the control condition, playing Tetris reduced the number of intrusions in the week after seeing the film. The beneficial effect of EM maintains when the negative memories pertain to loss and grief (Hornsveld, Landwehr, Stein, Stomp, Smeets & van den Hout, 2010).

EMDR is used for traumatic memories (flashbacks). Individuals may, however, also have prospective memories that may take the form of intrusive images about future events ("flashforwards"). In line with the WM account, vividness and emotionality of flashforwards are reduced when they are retrieved while making EM (Engelhard, van den Hout, Janssen, & van der Beek, 2010a). Individuals differ in working span capacity and in the capacity of dual-tasking. For individuals with relatively poor working span, the impact of a dual-task during recall should be relatively large. Consequently, WM theory predicts that people with relatively poor multi-tasking abilities show relatively large benefits from dual-tasks during recall of aversive memories. This has indeed been observed (Gunter & Bodner, 2008; van den Hout et al., 2010). In sum, laboratory data suggest that EMDR and related procedures derive their effects from WM taxing during recall of aversive memories (Holmes et al., 2009; Gunter & Bodner, 2008; Maxfield et al., 2008; van den Hout et al., 2010; Engelhard et al., 2010a).

WM is typically held to consist of three subsystems (Baddeley, 1998). The "central executive" (CE) allocates and divides attention between tasks, selects retrieval strategies, activates memories, and inhibits distractors. Furthermore, two "slave systems" are postulated: the visuospatial sketchpad (VSSP), involved in the processing of visuospatial information, and the phonological loop (PL), that processes verbal information. The question ensues what component(s) of WM is (are) affected by the tasks mentioned above. The dominant theoretical perspective on this issue suggests modality specificity (e.g., Baddeley, 1998). Eye movements should load the VSSP and verbal tasks should load the PL. In line with the modality specificity view, it has been found that eye movements strongly interfere with WM for (sequences of) locations and much more than equivalent limb movement or covert attention shifts without eye movements (Pearson & Sahraie, 2003). With regards to autobiographical memory, Lilley, Andrade, Turpin, Sabin-Farrell, and Holmes (2009) asked 25 PTSD patients who awaited treatment to recall elements of the trauma under three conditions: recall + EM, recall + counting or recall only, with all treatments lasting 8 × 8 s. Trauma memories became (temporarily) less vivid and less emotional during recall + EM but not during the other treatments, and the authors interpret their findings "as showing that the eye-movements task reduced image vividness by temporarily disrupting active maintenance and manipulation of traumatic images in the VSSP of working memory" (p. 317). There is no reason to doubt that EM load the VSSP, but they also load the CE (see below), and it is unclear to what degree the effects reported by Lilley et al. were due to CE effects or VSSP effects. The verbal condition (counting aloud from one upward) may have required less overall cognitive load than making the eye movements. If so, results may also be explained in terms of more CE effects by EM. Gunter and Bodner (2008; experiment 3) reported that effects of auditory shadowing were as strong as effects of EM on reductions of vividness/emotionality. While, obviously, this argues for a general (CE) account, Gunter and Bodner add that their findings do "not completely rule out the possibility that some of the benefit is due to taxing the VSSP" (2008, p. 927). Alternatively, the fact that, in contrast to Gunter and Bodner (2008), Lilley, Andrade, Turpin, Sabin-Farell, and Holmes (2009) found that EM were superior to counting and that, again in contrast to Gunter & Bodner, effects of EM disappeared after one week, may be explained by differences between participants in these studies: PTSD patients (Lilley et al.) and healthy volunteers (Gunter & Bodner). This stresses the need for direct patient-control studies. Finally, Kemps and Tiggemann (2007) found that, compared to recall + counting, recall + EM reduced vividness and emotionality of visual images to a greater degree than vividness/emotionality of auditory images, whereas recall + counting had larger effects on auditory images. The authors suggest that memory disruption by dual-tasks during recall is modality-specific. Still, inspection of their data (experiment II) shows that the largest effect was a general one. Compared to recall-only, recall + EM and recall + counting reduced vividness/emotionality of visual and auditory memories. Modality-specific effects were present, but they were superimposed on a much larger general, non-specific effect.

In sum then, laboratory data suggest that EMDR and related procedures derive their effects from the taxing of WM during recall of aversive memories (Engelhard et al., 2010b, 2011; Gunter & Bodner, 2008; Holmes et al., 2009, van den Hout et al., 2010; Maxfield et al., 2008). The data suggest that procedures like EM and counting have memory effects that are general, affecting the CE component of WM, as well as modality specific, affecting visuospatial or phonological aspects of memory.

Over the last decade, a new treatment evolved that intended to prevent the recurrence of depression: "mindfulness-based cognitive therapy" (MBCT; Segal, Williams, & Teasdale, 2002). Several trials have confirmed that MBCT, compared to treatment as usual, reduces relapse rates for depression (for a review see Coelho, Canter, & Ernst, 2007), and reduces depression severity (Barnhofer et al., 2009;

Download English Version:

https://daneshyari.com/en/article/910406

Download Persian Version:

https://daneshyari.com/article/910406

Daneshyari.com