

Research report

Consistent impaired verbal memory in PTSD: A meta-analysis

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Abstract

Background: Qualitative review papers have indicated that verbal memory impairment is found to be the most consistent cognitive impairment related to PTSD. These review papers have used qualitative methods to describe the effects, and consequently they have not been able to estimate the strength of the memory-PTSD association.

Methods: This meta-analysis of 28 studies examined the empirical evidence for this relationship, and factors affecting the results.

Results: Overall, the results showed medium effect sizes in patients with PTSD compared to controls on verbal memory across studies. Marked impairment was found in the patient groups compared to healthy controls, while modest impairment was found compared to exposed non-PTSD controls. Meta-analyses found strongest effects in war veterans compared to sexual and physical assault related PTSD. Rather unexpectedly no effect was found for the sexually abused PTSD groups compared to exposed controls. The analyses further showed that the effect was dependent on the test procedures used. The studies using WMS and AVLT had stronger effects than studies using CVLT.

Limitations: Insufficient data were available to analyze a more complete attention–memory profile.

Conclusions: This meta-analysis confirms that verbal memory impairment is present in adults with PTSD, and they are consistent across studies. This impairment should be the focus of work in clinical settings.

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Keywords: AVLT; Cognitive impairments; CVLT; Sexual abuse; War veterans; WMS

1. Introduction

The present study is a meta-analytic study that estimates the relationship between posttraumatic stress disorder (PTSD) and verbal memory impairments. Problems with concentration and memory in everyday situations are often reported by PTSD patients in clinical settings. Difficulties with concentration, intrusive recollections of the traumatic event, and yet inability to recall important aspects of the trauma are all different types of

memory disturbances integrated in the diagnostic criteria for PTSD (DSM-IV-R; American Psychiatric Association, 2000). The symptoms connected to problems with everyday memory are however not included as a criteria.

Neuropsychological studies have documented that PTSD is associated with significant impairment in cognitive functioning (e.g. Yehuda et al., 1995; Vasterling et al., 1998; Gilbertson et al., 2001). Studies have found that cognitive impairment in patients with PTSD specifically represent problems with attention and verbal memory functions (Vasterling et al., 1998; Yehuda et al., 2004). More recently, several studies

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have documented a more specific impairment in the memory process related to acquisition and encoding (Yehuda et al., 2004, 2005; Johnsen et al., 2008). Several reviews of the literature have in addition suggested that the memory impairment in PTSD is modality specific, with a stronger pronounced impairment in verbal than in visual stimuli (Horner and Hamner, 2002; Vasterling and Brailey, 2005). Although fairly consistently reported, verbal memory alterations in PTSD do not seem to be found in all studies (e.g. Crowell et al., 2002; Neylan et al., 2004).

The literature suggests a number of factors that may affect the memory performance of patients with PTSD, both clinical factors and study characteristics. Such factors may be type of trauma, comorbidity, control groups used and memory test used. War veterans and women exposed to sexual and physical abuse in childhood or as adults, have frequently been selected for studying the relationship between these factors (Knight and Taft, 2004). In addition, mixed traumas have been included in some studies where both physical assault and motor accidents and the like are examined together. Stein et al. (2002) have emphasized that differences in the characteristics of cognitive dysfunctions across traumas are to be expected. In studying the memory impairment in patients with PTSD, both comparisons with healthy control groups or exposed non-PTSD groups have been common approaches. Some studies have included both types of control groups, but this kind of design has been less frequent. Yehuda (2005) has argued that the exposed non-PTSD controls groups are a challenging group to include because they may have variable sub-clinical symptomatology, but these control groups are important comparisons in understanding how exposed individuals with and without PTSD differ on cognitive variables.

Although some qualitative review papers have reported specific impairment in initial acquisition and memory (e.g. Buckley et al., 2000; Horner and Hamner, 2002; Isaac et al., 2006), a profile of memory impairment has been difficult to reveal. These review papers have used qualitative methods to describe the effects, and consequently they have not been able to estimate the strength of the memory-PTSD association or examined the differential strength of association within different trauma groups. An additional problem is that the research within this area has been conducted on small sample sizes in an effort to use both stringent diagnostic criteria and to equate the patient groups and control groups on key variables. Each study, therefore, has low statistical power. It has been suggested that the most suitable way to examine associations between

constructs, such as memory and PTSD, is to rely on effect size values examined within meta-analyses (Lipsey and Wilson, 2001). In a meta-analytical approach, the relationship between PTSD and memory impairment may be established more clearly, because the analysis synthesizes effect sizes across a representative collection of studies and provides greater power to detect group differences.

During the present research, Brewin et al. (2007) published a meta-analytical study on memory impairment in PTSD. This study established a moderate association between verbal memory and PTSD, but the effect of memory measures and control groups within different trauma was not examined.

The first aim of the present review is to meta-analyze the verbal memory findings of existing studies in order to determine the extent of verbal memory impairments in patients with PTSD. The second aim is to test differences in effect within specific types of traumas. The third aim is to test if the effect is dependent on the control group the patient group is compared with, either a healthy control group or an exposed control group without PTSD. Finally, we examine if the effect is dependent on the memory measures used.

2. Method

2.1. Literature search

Published studies, that examined the relationship between verbal memory functioning and PTSD, were gathered through the use of the databases PubMed, PsychINFO and ISI Web of Science from 1989 to April 2007. The keywords used were “cognitive”, “memory”, “neuropsychological”; each of them in combination with “posttraumatic stress disorder” or “PTSD”. In addition, reference lists from these articles and journals, frequently publishing in the target domain, were searched. No attempt to locate unpublished studies was made.

2.2. Criteria for inclusion

In order to be included in the analysis, the study must have been published in English. In reviewing the different studies in this field, most of the studies had based their diagnosis on a clinical-administered structured interview. Only one study had based the diagnosis on an interview based on the formal diagnostic criteria of DSM-IV. A few studies used self-report measures to establish the clinical group. All these different procedures to establish the clinical group were accepted as adequate. The studies had to compare adult patients,

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