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Review

Neuropsychological impairments in panic disorder: A systematic review

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ABSTRACT

Background: There is a growing body of literature investigating the neuropsychological profile of panic disorder (PD), some of which suggests potential cognitive dysfunction. This paper systematically reviews the existing literature on neuropsychological performance in PD.
Method: PsycINFO, EMBASE, MEDLINE and PsycARTICLES databases were searched to identify articles reporting on neuropsychological function in PD published in English during the time period 1980 to March 2012. 14 studies were identified.
Results: There was limited support for impairment in short term memory among individuals with PD, although this was not found across all studies. Overall, the reviewed studies did not support the presence of impairment in other areas of cognitive functioning, including executive function, long term memory, visuospatial or perceptual abilities and working memory.
Limitations: Studies with samples of fewer than 15 participants per group were excluded from this review. A limited amount of research has been published on this topic and small sample sizes (under 25 per group) have been used by many studies. Therefore, the current review is based on a small number of studies with limited power.
Conclusions: There is limited evidence of specific neuropsychological impairments in participants with PD. Impairments in short term memory warrant further investigation to establish their relevance to clinical practice. Larger sample sizes and appropriate statistical adjustment for multiple comparisons in future studies is highly recommended.

Contents

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1. Introduction

Panic disorder (PD) is a disabling mental health problem characterised by unexpected, recurrent panic attacks, fear about the implications of attacks and modifications of behaviour as a result of the attacks (American Psychiatric Association, 2000). PD can occur with or without agoraphobia and is associated with high levels of psychiatric comorbidity and severe role impairment (Baillie and Rapee, 2005; Kessler et al., 2006). A number of recent studies have focused on the neurobiology of common psychiatric disorders, including anxiety disorders, and underlying cognitive impairments associated with them (Millan et al., 2012). Impairments in neuropsychological functioning are of interest as they may have implications for treatment outcomes, as has been seen in schizophrenia and anorexia nervosa (Cavedini et al., 2006; Tabarés-Seisdedos et al., 2008). These impairments may also act as measurable symptoms of underlying neurobiological dysfunction. Several studies have found structural brain abnormalities in patients with anxiety disorders, including patients with PD (Mataix-Cols and van den Heuvel, 2006; Phan et al., 2009; Szeszko et al., 2005; van den Heuvel et al., 2005). Patterns of impairments in executive function have been reported in a number of recent reviews of neuropsychological performance in OCD (Martinez-Gonzalez and Piqueras-Rodriguez, 2008; Menzies et al., 2008; Olley et al., 2007). Executive function impairments have also been implicated in Post Traumatic Stress Disorder (PTSD; Aupperle et al., 2012); however PD has been less well researched.

In PD, imaging studies have indicated abnormalities in specific brain regions compared to controls, including different metabolic activity in the hippocampal and parahippocampal areas (Bisaga et al., 1998) and abnormalities in the temporal lobe structures (Vythilingam et al., 2000). Brain abnormalities such as these may lead to learning and memory deficits, if present in panic disordered individuals. However Reiman and colleagues have noted that in their work, similar regional blood flow patterns have been seen in panic disordered patients as in healthy controls with anticipatory anxiety. It remains unclear whether abnormalities seen relate to structural differences or effects of state or trait anxiety (Reiman et al., 1989a, 1989b).

It has been suggested that state and trait anxiety may influence performance on neuropsychological testing, confounding neuropsychological testing in anxiety disorders (Orsillo and McCaffrey, 1992). Recent research has investigated the potential effects of state or trait anxiety on neuropsychological test performance in a number of different populations including a mixed psychiatric sample (O'Jile et al., 2005; Smitherman et al., 2007). Neither state nor trait anxiety were found to have a significant effect on executive function (Horwitz and McCaffrey, 2008; Smitherman et al., 2007; Waldenstein et al., 1997) nor on memory and verbal learning (Kizilbash et al., 2002; O'Jile et al., 2005; Waldenstein et al., 1997), once age, gender and IQ were controlled for. Performance on an attention test was found to be unaffected by state or trait anxiety in healthy males (Waldenstein et al., 1997). Gass and Curiel (2011) reported that test anxiety did not impair performance on the coding or block design subtests of the WAIS-III in their sample of veterans, which are recognised as requiring sustained attention and concentration, often thought to be affected by anxiety. State anxiety, was found to significantly affect performance by veterans on working memory tasks, however this effect was reduced when education was controlled. (Gass and Curiel, 2011). An effect of anxiety on working memory was not seen by Waldenstein et al. (1997) using the digit span task on healthy male participants.