

IMPULSIVITY IN PANIC DISORDER: NEUROPSYCHOLOGICAL CORRELATES

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SUMMARY

Background: Impulsivity plays a prominent role in numerous psychopathological states and poses an important clinical dilemma. However, different aspects of impulsivity are related to mood disorders, addictions, personality disorders, eating disorders, the relationship between anxiety and impulsivity is controversial and not well explored. The impact of anxiety on cognitive functioning is less explored than in other disorders (e.g. depression). The findings on cognitive functioning and impulsivity in anxiety disorders are inconsistent and are most likely due to methodological differences between the studies.

Material and methods: Eleven patients diagnosed with panic disorder (DSM-IV-TR) and nine healthy volunteers were enrolled to the study. Both groups did not differ significantly in terms of age, gender and educational level. The experimental group comprised of psychotropic drug naïve patients. The severity of PD was measured with Panic and Agoraphobia Scale. Impulsiveness was evaluated with the Barratt Impulsiveness Scale – 11th version (BIS-11). To assess cognitive functions CANTAB (Cambridge Neuropsychological Test Automated Battery) was used and Paired Associate Learning (PAL) test was chosen for episodic memory evaluation.

Results: Mean BIS-11 scores observed in the group of psychotropic drug naïve patients with panic disorder were 71.36 (SD 7.31). Mean BIS-scores recorded in the control group were 60.77 (SD 9.57). The correlation between impulsivity and PAL results in the experimental group was found at the level $r=0.708723$; $p<0.05$. The respective value for the controls was $r=0.200839$; $p<0.05$.

Conclusions: Impulsivity in the experimental group was higher than adjusted average for the control group. Our findings indicate also the correlation between impulsivity and cognitive deficits in panic disorder in psychotropic drug naïve patients.

Key words: panic disorder – impulsivity - cognitive functioning - BIS-11 - CANTAB

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INTRODUCTION

The prevalence of panic disorder in the general population is roughly 4.8%. In 20% of patients the course of the disorder is chronic, recurrent and associated with high psychic discomfort. Negative effects of Panic Disorder (PD) on social, familial and occupational functioning are comparable to those of depression (Park et al. 2012).

Panic disorder seems to be considerably related with cognitive processing. The neuroanatomical structures comprising the fear network model of panic attacks involve medial prefrontal cortex, anterior cingulate cortex, lateral prefrontal cortex, insula, thalamus, amygdala, brainstem (Gorman 2000). Apart from Gorman's model Lai proposed an extended fear circuitry model for PD, which also includes temporal regions (Lai et al. 2013). In patients with PD the fight or flight response is not adequately calibrated. Thus, changes in the body's internal homeostasis lead to altered synaptic transmission and increased firing of neurons in the locus coeruleus (Nutt & Ballenger 2003).

Cognition is associated with complex mental activities involving acquisition, processing, storage and retrieval of information by means of cognitive functions including attention, learning, memory, verbal ability, visuospatial skill, logical thinking, and problem solving

(Airaksinen et al. 2005). Cognitive dysfunctions in panic disorder are not only the result of negative past experiences but probably also the effect of numerous neuropsychological dysfunctions. However, study results produce inconsistent findings. It seems interesting to assess cognitive stimuli processing as related to ones impulsivity since it is the neurophysiologically based inability to confirm behaviour to its context or consequences.

Overimpulsiveness characterizes numerous mental disorders. The relationship between impulsivity and mood disorders is well documented. Study data show that attention impulsivity was related to either depression or mania, motor impulsivity correlated to mania, nonplanning impulsivity was related to depression (Swann et al. 2008). The reports show that nonplanning impulsivity was increased in patients with personality disorders (Dougherty et al. 2000), attentional impulsivity was increased in patients with Axis I psychiatric disorders (Swann et al. 2002), motor impulsivity was increased in patients with bipolar disorder who also had impulse control disorders (Lejoyeux et al. 2002). The relationship between anxiety disorders and impulsivity is unclear. Our preliminary study confirmed that patients diagnosed with panic disorders had a higher level of impulsivity trait than healthy control (Jakuszkowiak-Wojten et al. 2012).

SUBJECTS AND METHODS

We examined eleven psychotropic drug naïve patients with panic disorder recruited from the outpatient setting. The inclusion criteria were 18-60 years of age and the diagnosis of Panic Disorder based on SCID-I (DSM-IV-TR). The exclusion criteria were the presence of any chronic somatic illness, positive history of neurological disorders, substance abuse, concomitant medication with beta-blockers, steroids, calcium channel blockers, triptans, and any positive history of psychotropic medication. The control group consisted of nine healthy volunteers.

The severity of Panic Disorder was assessed with Panic and Agoraphobia Scale (PAS). Learning, visual and verbal memory and spatial skills were measured using selected subtests from the Cambridge Neuropsychological Test Automated Battery (CANTAB). This is a suite of computerised tests employing a touch-sensitive screen, which has been used to examine differential patterns of cognitive deficit in various patients (Owen 1997). CANTAB contains 22 neuropsychological tests in five cognitive domains measuring visual memory, verbal memory, decision making and response control, executive function and attention. From CANTAB subtests the performance on Paired Associate Learning (PAL) was chosen. Impulsiveness was evaluated with the Barratt Impulsiveness Scale, 11th version (BIS-11). BIS-11 is a 30-item self-rated scale. Items are rated from 1-absent to 4-most extreme (Swann et al. 2008). Health controls generally score in the range of 50-60 (Swann et al. 2002). The Barratt Impulsiveness Scale assesses impulsivity on the subscales attentional impulsivity (inability to focus attention or concentrate), motor impulsivity (acting without thinking), and non-planning impulsivity (lack of future orientation or forethought) (Meule 2013).

The statistical analysis was performed using non parametrical Spearman's rank correlation test. All analysis were conducted with Statistica v.10.0 software.

The study protocol was approved by the local bioethics committee at the Medical University of Gdańsk.

RESULTS

Mean BIS-11 scores observed in the group of psychotropic drug naïve patients with panic disorder were 71.36; SD 7.31. Mean BIS-scores recorded in the control group were 60.77; SD 9.57.

The correlation between impulsivity and PAL results in the experimental group was found at the level $r=0.708723$; $p<0.05$. The respective value for the controls was $r=0.200839$; $p<0.05$.

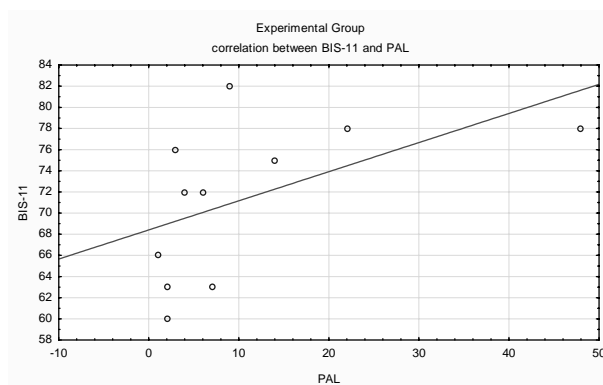


Figure 1. Experimental group correlation between impulsivity (BIS-11) and cognitive functions (PAL)

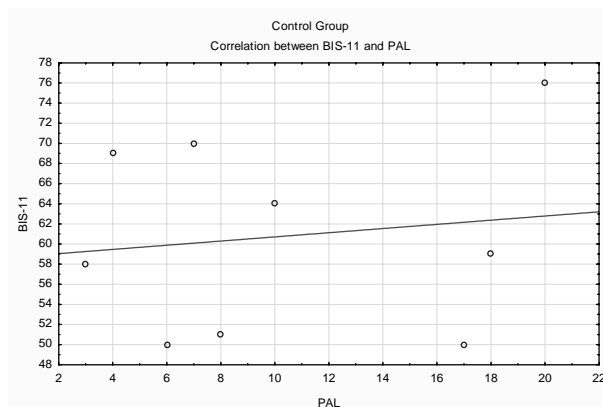


Figure 2. Control group correlation between impulsivity (BIS-11) and cognitive functions (PAL)

DISCUSSION

Findings regarding panic disorder and cognitive impairment findings are inconsistent (Hovland et al. 2012). Some studies have found significant cognitive dysfunction in PD (Cohen et al. 1996; Lucas et al. 1991; Boldrini et al. 2005; Asmundson et al. 1995). Others found no evidence of cognitive dysfunction among patients with PD (Gladsjo et al. 1998; Purcell et al. 1998). The Paired Associate Learning (PAL) performance depends on input mainly from temporal and frontal lobes. Studies have utilized PAL-variables in differentiating between the healthy and patients with depression, Alzheimer's disease, and mild cognitive impairment (Junkkila et al. 2012).

Furthermore, some studies found no correlation between anxiety and impulsivity (Apter 1993, Lecrubier 1995, Caci 1998, Askenazy 2000). However, in the exploratory studies by subtype in individuals with social anxiety disorder impulsivity related to a specific predisposition toward risk taking behaviours, impulsivity, relational and affective, interpersonal instability was higher as compared with healthy controls (Kashdan & Hofmann 2008, Kashdan et al. 2009). In a study by Summerfeldt et al. (2004) patients with PD reported higher scores than healthy controls, in total, attentional,

and not planning subscales of BIS-11 (Summerfeldt et al. 2004). It also seems that the state and trait of impulsivity are higher in patients with anxiety disorders than in healthy controls (Perugi et al. 2011). Thus, our findings corroborate with the prior reports of higher impulsivity traits and cognitive impairment among patients with anxiety disorders.

CONCLUSIONS

Our findings indicate the positive correlation between impulsivity and cognitive deficits in panic disorder in psychotropic drug naïve patients.

Limitations

The sample size was limited, however, all patients were drug free (no history of psychotropic medication in life).

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Conflict of interest: None to declare.

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