

Changes in Neurocognitive Functioning After Six Months of Mentalization Based Treatment for Borderline Personality Disorder

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INTRODUCTION

Borderline personality disorder (BPD) is a severe mental disorder characterized by instability in emotion regulation, impulse control, interpersonal relationships, and self-image (1). The disorder is associated with deficits in a range of neurocognitive functions, most notably, sustained attention, working memory, episodic memory, and executive functions such as planning and response inhibition (2,3). Attentional networks appear to be specifically affected in BPD, especially those involved in conflict resolution and cognitive control (4). The clinical impacts of neurocognitive deficits in BPD are yet to be fully established, although deficits have been linked to more lethal self-injurious behaviors (5), more use of inpatient psychiatric services (6), and drop-out from psychotherapy (7). Mentalization based therapy (MBT) has been developed specifically to improve symptoms of BPD by enhancing mentalization. Psychological interventions, such as MBT, which are aimed at improving intrapersonal and interpersonal functioning, may alter neural systems underlying certain neurocognitive abilities, including attention and executive functions (8), perhaps by enhancing social-cognitive skills required to support mentalization ability. However, no studies to our knowledge have investigated potential changes in neurocognitive functioning in patients with BPD undergoing MBT, and it remains unclear whether neurocognitive deficits may be remediated by a mentalization-based intervention to improve symptoms of BPD.

AIMS

The primary aim of this research project is to evaluate whether neurocognitive functioning may be associated with improvements in the clinical severity of BPD after six months of MBT, potentially illuminating factors that may underlie improvements in BPD symptoms through treatment.

METHODS

SUBJECTS

Patients

18 female patients aged 18–45 diagnosed with BPD according to DSM-IV criteria recruited from Region Zealand were included. Patients with severe comorbid psychopathology and somatic illness were excluded.

Controls

28 healthy control subjects matched on sex, age and parental socioeconomic status were included. Any sign of psychopathology in the control subject or in first degree relatives lead to exclusion.

DESIGN

At baseline both patients and healthy control subjects were assessed by using a battery of neuropsychological paper-and-pencil and computerized tests to assess cognitive function. Subsequently the BPD patients underwent 6 months of intensive mentalization based treatment before being retested with the same neuropsychological assessment, in order to reveal any changes in cognitive and affective function after treatment.

MEASURES OF PSYCHOPATHOLOGY

MINI, SCID-II, ZAN-BPD, HAM-D, GAF

NEUROPSYCHOLOGICAL INSTRUMENTS

Wechsler Adult Intelligence Scale—Fourth Ed. (WAIS–IV)

Perceptual Reasoning: Block Design / Matrix Reasoning / Visual Puzzles

Working Memory (auditory/verbal): Digit Span / Arithmetic / Letter-Number Sequencing

Processing Speed: Symbol Search / Coding

Hopkins Verbal Learning Test—Revised (HVLRT-R)

Cambridge Neuropsychological Test Automated Battery (CANTAB)

Spatial Span, Attention Switching Task, Paired Associates Learning, Rapid Visual

Information Processing, Stop Signal Task.

RESULTS

Table 1. Changes in Neuropsychological performance after Six Months of Mentalization Based Therapy for Patients with Borderline Personality Disorder and 6 months of no treatment for healthy controls. Testing interaction effects of time x group (repeated measures). Raw scores.

	Patients (n = 18)		Controls (n = 28)		F	df	Sig. (2-tail)	Partial Eta Sq.
	Time 1	Time 2	Time 1	Time 2				
Processing Speed*	51.83 (8.25)	54.17 (6.61)	58.68 (1.64)	62.90 (1.61)	0.46	31	p = .50	.02
Sustained Attention	0.52 (0.20)	0.67 (0.13)	0.72 (0.15)	0.70 (0.18)	8.98	44	p = .004	.17
Working Mem – aud/verbal	18.75 (3.14)	18.14 (3.30)	20.00 (3.10)	19.90 (3.30)	0.48	44	p = .49	.01
Working Mem - visuospatial	5.72 (1.49)	6.22 (1.11)	7.21 (1.37)	7.11 (1.20)	1.76	44	p = .19	.04
Verbal Episodic Memory	16.92 (3.12)	17.64 (2.62)	17.98 (2.51)	19.00 (3.22)	0.10	44	p = .75	.00
Visual Episodic Memory	22.06 (2.41)	21.61 (3.26)	22.68 (2.86)	22.54 (2.47)	0.12	44	p = .73	.00
Perceptual Reasoning	26.55 (5.35)	30.06 (4.03)	28.77 (3.60)	30.05 (4.09)	4.35	44	p = .04	.09
Response Inhibition	0.48 (0.06)	0.45 (0.09)	0.47 (0.08)	0.48 (0.07)	2.05	44	p = .16	.05

Note: BPD = borderline personality disorder; df = degrees of freedom; M = mean; SD = standard deviation.
* patients n = 12, controls n = 21

Table 2. Clinical changes after Six Months of Mentalization Based Therapy in Patients with Borderline Personality Disorder (n=18)

	Pre-Treatment	6 Months	t	df	Sig. 2 tails	Cohen's d
Zanarini Rating Scale for BPD						
Affect	4.50 (2.01)	4.00 (1.78)	0.82	17	.43	.80
Cognition	2.83 (1.54)	2.50 (1.54)	0.75	17	.46	.62
Impulsivity	1.17 (1.25)	0.61 (0.85)	1.71	17	.11	.11
Relationships	2.28 (1.78)	1.22 (1.26)	2.96	17	<.01	.40
Total Score	10.78 (5.00)	8.39 (4.00)	5.19	17	.08	.88
Hamilton Depression Rating Scale	12.89 (4.72)	9.89 (3.97)	2.71	17	<.05	1.10
GAF - F	47.56 (8.86)	47.33 (7.36)	0.12	17	.91	.03
GAF - S	51.39 (4.03)	52.78 (6.85)	-0.80	17	.43	.02

Note: n = 18 patients completed six months of treatment; BPD = borderline personality disorder; df = degrees of freedom; M = mean; SD = standard deviation; ZAN-BPD Cutoff scores: Affective dysfunction: 0-12, cognitive dysfunction: 0-8, impulsivity: 0-8, dysfunctional relationships: 0-8, Total scores goes from 0-36; HAM-D Cutoff scores 0-7 = no depression, 8-16 = mild depression, 17-23 = Moderate depression, 24+ = severe depression; GAF Cutoff scores 0-100. 100 signifies no symptoms and superior functioning.

Significant Improvements in perceptual reasoning correlated with sign. gains in interpersonal functioning on the ZAN-BPD (Spearman $r = .49$, $p = .04$).

Higher pre-treatment processing speed was associated with participation in more psychotherapy sessions combined across individual and group treatments (Spearman $r = .58$, $p = .02$).

DISCUSSION

1. Improvement in attentional capacity after MBT might reflect how shared attentional processes in MBT may serve to strengthen the interpersonal integrative function, which again is thought to rely on multiple skills, especially affect regulation through a capacity for effortful control and regulation of attention (10).

2. Improved perceptual reasoning among patients after MBT was related to improvements in interpersonal relationships. MBT may improve a patient's capacity to analyze and synthesize abstract nonverbal stimuli, which could heighten perceptual reasoning skills among patients undergoing MBT (9).

3. Higher pre-treatment processing speed was associated with participation in more psychotherapy hours. Patients better able to rapidly process information may have a propensity to consume more information and lead them to complete more hours of psychotherapy.

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