Cognitive and emotion recognition deficits in obsessive–compulsive disorder

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Abstract

Previous investigations have demonstrated impaired recognition of facial affect and cognitive dysfunction in several psychiatric disorders. The specificity of these deficits is still debated. The aim of this study was to investigate the deficits in emotion recognition and cognition in obsessive–compulsive disorder (OCD). Forty patients with OCD (DSM-IV, 16 women, 34.7 ± 10.4 years) and 40 healthy volunteers (16 women, 34.7 ± 8.7 years) were compared. All participants underwent a computerized neuropsychological test battery (Gur, R.C., Erwin, R.J., Gur, R.E., Zwil, A.S., Heimberg, C., Kraemer, H.C., 1992. Facial emotion discrimination II. Behavioral findings in depression. Psychiatry Research 42, 241–251; Gur, R.C., Ragland, J.D., Moberg, P.J., Turner, T.H., Bilker, W.B., Kohler, C., Siegel, S.J., Gur, R.E., 2001. Computerized neurocognitive scanning: I. Methodology and validation in healthy people. Neuropsychopharmacology 25, 766–776). A German version of the Penn Facial Emotion Acuity Test, the Facial Emotion Intensity Differentiation, including happy, sad and neutral faces, and the Facial Memory Test were administered. Executive functions were assessed by a computerized version of the Wisconsin Card Sorting Test and attention was evaluated using the Continuous Performance Test. OCD patients performed more poorly than healthy controls in facial memory tests (especially delayed), as well as in attention and executive functions. The only significant difference between the groups in emotion processing was poorer recognition of sad female faces in patients, who misperceived neutral faces as sad. The results point to memory and executive deficits in addition to a "negative" bias in emotion recognition in OCD patients.
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1. Introduction

Obsessive–compulsive disorder (OCD) is a common and rather disabling disorder with neurobiological and neuropsychological abnormalities. There is growing

evidence for neuropathophysiological dysfunction in OCD related to thalamocortical basal ganglia loops (Saxena et al., 1999). Cognitive deficits seem to be prevalent in OCD (Kuelz et al., 2004). Recognition of basic emotions may be based on neural pathways that project to the inferior frontal cortex (Sprengelmeyer et al., 1998). The orbitofrontal cortex is one of the central regions besides the basal ganglia that may be affected in OCD (Whiteside et al., 2004). When OCD patients are

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compared with normal controls, memory deficits are observed both in non-verbal (Savage et al., 1996) and verbal memory (Deckersbach et al., 2000).

Thus far, little is known about the emotion recognition of OCD patients. The only emotion reported to be impaired in OCD patients is disgust (Sprengelmeyer et al., 1997). Mancini et al. (2001) also found impairment in the recognition of disgust in associations with OC symptoms. In contrast, no significant differences in emotion recognition were found between OCD patients and normal controls (Kornreich et al., 2001; Buhlmann et al., 2004).

So far, little evidence has been found for impairment in emotion recognition in OCD, although some studies have methodological problems (small sample sizes and problematic stimulus material). In conclusion, OCD only seems to be characterized by impairment in recognizing disgust and in verbal and nonverbal memory. Nothing conclusive is known about the other basic emotions in OCD.

The aim of the study was to assess emotion deficits in OCD patients by examining facial recognition processing with the Computerized Neuropsychological Test Battery (CNP). Facial recognition was investigated in a case control design with OCD patients compared with normal healthy controls. In particular, the Penn Emotion Acuity Test, which reflects emotion discrimination, the Emotion Differentiation Task and the Penn Facial Memory Test were administered. An additional aim of our study was to examine whether emotion processing deficits are associated with neurocognitive performance. We hypothesized that OCD patients would be impaired in recognizing happy and sad faces, in abstraction flexibility (WCST) and in attentional vigilance (CPT).

2. Method

2.1. Subjects

The sample consisted of 40 OCD patients (24 males and 16 females), who met DSM-IV criteria (American Psychiatric Association, 1994) using the Structured Clinical Interview for DSM-IV (First et al., 1995a), were consecutively recruited at the Medical University of Vienna, Department of Psychiatry. They were treated with selective serotonin reuptake inhibitors at the outpatient clinic for OCD patients. Patients gave their written informed consent before participation. Five patients refused to take part in the investigation.

People with disorders other than OCD, diagnosed using the DSM-IV diagnostic criteria, were excluded

from the study. The patients were clinically investigated for comorbidity and additionally assessed with the patient version for the SCID (SCID-P). Patients with comorbid axis I disorder: cognitive disorders, substance abuse disorders, schizophrenia/psychotic disorders, affective disorders and anxiety disorders were likewise excluded. The additional exclusion criteria were a Mini Mental Status Examination score below 24, left handedness and impaired vision.

The mean age of the OCD patients was 34.8 ± 10.4 years. All but one of the OCD patients had obsessions as well as compulsions. The mean OCD severity was moderate as determined by a score on the Yale–Brown Obsessive-Compulsive Scale (Y-BOCS) (Goodman et al., 1989) of 20.8 ± 8.5. The age of onset was between 8 and 49 years, with the median for men 4 years below that for women ($Md = 17.5$ vs. 21.5). Average length of illness was 13.9 ± 8.8 years. Only 35% had uncontrolled obsessions during testing, with one patient feeling impairment during the tests because of obsessions.

Patients were matched for age and sex with 40 control subjects who were free of psychiatric history. Healthy controls underwent a comprehensive assessment (Structured Clinical Interview for DSM-IV Nonpatient Version, SCID-NP, First et al., 1995b). Mean age of the control subjects was 34.7 ± 8.8 years. The average length of education of the controls was 16.0 ± 5.1 years, which was higher than for the OCD patients (12.8 ± 3.0 years), ($t = 3.356$, $df = 78$, $P < 0.001$) (Table 1).

2.2. Measures

2.2.1. Facial emotion recognition tasks

We used tests developed at the University of Pennsylvania (Erwin et al., 1992; Gur et al., 1992, 2001; Heimberg et al., 1992), with established validity and reliability (Rojahn et al., 2000). Faces used with previous studies for the recognition of facial emotion show shortcomings with regard to optimal standardization. In previous tests photographs were used which had asymmetries and differed with regard to non-standardized

Table 1
Sociodemographic characteristics

	OCD patients	Healthy controls	Significance
Gender (men/women)	24 / 16	24 / 16	n.s.
Age (years)	34.8 ± 10.4	34.7 ± 8.8	n.s.
Education (years)	12.8 ± 3.0	16.0 ± 5.1	$P < 0.001$
Handedness	right	right	
Duration of illness	13.9 ± 8.8		

n.s.: not significant.