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Decision-making functioning as a predictor of treatment outcome in anorexia nervosa

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Abstract

The pathological eating behaviour of patients with anorexia nervosa reflects a deficit in planning real-life strategies that can be observed in an experimental setting through the Gambling Task, a tool designed to detect and measure decision-making abilities. We examined the role of Gambling Task performance as a predictor of treatment outcome in anorectic patients, and we evaluated changes in decision-making after clinical improvement. Performance on the Gambling Task was evaluated, and a clinical–nutritional assessment of 38 anorectic patients was carried out before and after a cognitive–behavioural and drug treatment program. Task performance of anorectic patients was compared with that of 30 healthy control participants. Patients who had a better decision-making profile at baseline showed significantly greater improvement in nutritional status. The decision-making deficiency of some anorectic patients is probably linked to those individual features that contribute to the phenomenological expression of the disorder and to its different treatment outcomes.
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1. Introduction

The pathological eating behaviour of patients with anorexia nervosa (AN) reflects an impairment in planning real-life strategies. This deficit could account for the inability of some AN patients to take a long-term perspective and their preference to opt for choices that yield high immediate gains in spite of higher future losses (Cavedini et al., 2004a). The preference of AN patients for choices that are advantageous in the short-term but not in the long run is confirmed from their impaired performance on tasks modelling real-life decision-making processes. For example, during the acute phase of illness, AN patients are impaired on the Gambling Task (GT) (Cavedini et al., 2004a), a measure of decision-making propensities (Bechara et al., 1994). Their poor performance on this neuropsychological test does not appear to be related to illness severity, thus suggesting the absence of any relationship between nutritional status, severity of symptoms and general cognitive impairment in these patients (Lauer et al., 1999).

Similar decision-making impairments, detected in real life as well as in the laboratory with the GT, can also be found in patients with obsessive–compulsive disorder (Cavedini et al., 2002; Cavallaro et al., 2003),

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to the extent that several authors suggested that AN could be considered as a form of obsessive–compulsive disorder (Halmi et al., 2003). Indeed, evidence from clinical, family and genetic studies suggests the inclusion of AN within the obsessive–compulsive spectrum (Matsunaga et al., 1999; Cavallini et al., 2000; Bellodi et al., 2001).

However, the decision-making profile of patients with obsessive–compulsive disorder, as reflected by their performance on the GT, shows important individual differences. A further investigation observed that those subjects who perform poorly on the GT go on to show a poor clinical outcome to pharmacological anti-obsessive treatment with serotonin re-uptake inhibitors (Cavedini et al., 2002), indicating the GT may be a predictor of clinical outcome and suggesting the identification of obsessive–compulsive patients with specific traits significantly associated to clinical outcome (Erzegovesi et al., 2001; Alonso et al., 2001). It would be valuable if similar cognitive deficits in AN patients could be used to predict clinical outcome and aid in the development of optimal treatment strategies (Fassino et al., 2001).

The present study is a continuation of our studies on decisional processes in obsessive–compulsive spectrum disorders and stems from our previous study on AN (Cavedini et al., 2004a). A subgroup of the patients in the current study ($n=12$, 28.5%) were also included in the earlier report.

2. Methods

2.1. Sample

Forty-two female participants with AN among those referred to the Eating Disorders Clinical and Research In-patients Unit of San Raffaele Scientific Institute of Milan agreed to participate to the study, over a period of 10 months. Thirty-eight participants (18 with AN restricting subtype, AN-r, and 20 with AN binge-eating/purge subtype, AN-be) were included in the study while four dropouts were excluded (see Section 2.3).

Exclusion criteria for AN patients were lifetime psychiatric disorders other than anorexia, major medical diseases, neurological syndromes, brain injury or trauma, drug or alcohol abuse, use of any psychotropic drugs in the previous 6 weeks and receiving any other kind of therapy (i.e. behavioural therapy). Consensus diagnoses, according to DSM-IV criteria (American Psychiatric Association, 1994), were obtained by two senior psychiatrists who independently assessed all participants using a clinical interview and the MINI International Neuropsychiatric Interview-Plus (Sheehan et al., 1998), a diagnostic interview designed to meet the need for a short but accurate structured psychiatric interview for DSM-IV and ICD-10 disorders. The severity of eating symptoms was assessed with the Yale–Brown Cornell Eating Disorder Scale (YBC–EDS) (Mazure et al., 1994) while the physical condition of the patients was examined with the Body Mass Index (BMI) expressed as kg/m^2.

Thirty female healthy controls (HC), matched for age and education to the AN participants, recruited through local advertisements among college students, administrative and workers' staff of the hospital, agreed to participate in the study. The control participants were free of any lifetime psychiatric disorder, medical or neurological diseases and drug or alcohol abuse. All the participants gave their written informed consent to participate after the procedure and possible side effects had been fully explained.

2.2. Assessment

Patients and control participants were assessed with the following neuropsychological tasks: (a) the Gambling Task (GT) specific for the investigation of decision-making, (b) Weigl's Sorting Test and (c) the Object Alternation Test for the assessment of two other cognitive functions different from decision-making, in order to investigate whether patients were impaired just in decision-making or in general cognitive domains. These neuropsychological tasks were administered by a trained neuropsychologist in a single session and in a randomized sequence; the complete testing session never required more than 90 min, and all participants completed the tests without any problems in cooperation or fatigue.

2.2.1. Gambling Task (Bechara et al., 1994)

The subject is given a loan of play money, and the task requires making 100 card selections from four decks. The output of each selected card can be either a gain or a gain and a loss of money: decks A and B are "disadvantageous" in the long run because the total gain is lower than the total loss, while decks C and D are "advantageous" because the penalties are lower. The goal of the task is to maximize profit. The score reported is based on the difference between the number of "advantageous" minus the number of "disadvantageous" cards selected (net score).

The task was also administered after the treatment program (see Section 2.3): for this purpose, the output

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