Eating Behaviors 15 (2014) 591–594

Contents lists available at ScienceDirect

Eating Behaviors

Body checking as a behavioral link: A preliminary study assessing inhibition and its association to idiosyncratic body checking in anorexia nervosa

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ARTICLE INFO

Article history:
Received 17 March 2014
Received in revised form 28 May 2014
Accepted 13 August 2014
Available online 23 August 2014

Keywords:
Body checking
Anorexia nervosa
Inhibition

ABSTRACT

Body checking (BC) is a behavioral feature of anorexia nervosa (AN), which is also present in obsessive–compulsive (OC) disorders. This study assessed whether increased body checking in AN patients correlated with deficits in cognitive inhibition. A battery of neuropsychological tests (the Ravello Profile), OC disorder measures, and the Body Checking Questionnaire (BCQ) were administered to nine adolescent females being treated for AN at an in-patient hospital in Scotland, UK. Neuropsychological measures were assessed using composite variables. Body Checking prevalence was split into high and low category to compare across groups. A negative relationship between cognitive inhibition and idiosyncratic body checking was evident. Clinically, increased body-checking symptoms were related to OC symptoms. These findings provide preliminary evidence that idiosyncratic body checking in AN patients may indicate a similar neuropsychological profile found in those with checking behaviors in OCD patients.

1. Introduction

The diagnostic features of anorexia nervosa (AN) – such as obsessive thoughts and ritualistic checking behaviors – have prompted comparisons with obsessive–compulsive (OC) disorders. Evidence for such a link includes clinical, psychological, epidemiological and neuropsychological relationships between AN and OC disorders (Serpell, Livingstone, Neiderman, & Lask, 2002).

Compulsive checking, more specifically, body checking (BC) is a behavioral manifestation of negative body image present in both AN and OC disorders (Halmi et al., 2003; Mountford, Haase, & Waller, 2006; Rosen & Ramirez, 1998; Vartanian & Grisham, 2011). Examples of BC include repeated pinching of body parts to measure fatness or touching body parts when seated to measure fatness (Reas, Whisenhunt, Netemeyer, & Williamson, 2002). Body checking behaviors are classified into three categories; appearance related concerns, specific body part checking, and unusual or idiosyncratic checking behaviors (Reas et al., 2002).

The cognitive profile of individuals with AN supports the rigidity and obsessive–compulsive nature of the disorder. Impairments in cognitive inhibition lead to rigidity in both reasoning and behavior (Roberts, Tchanturia, Stahl, Southgate, & Treasure, 2007; Roberts, Tchanturia, & Treasure, 2010; Rose, Davis, Frampton & Lask, 2011; Tchanturia, Campbell, Morris, & Treasure, 2005). Recently, research on specific OCD clinical subtypes, such as checkers, has highlighted neuropsychological differences among these subtypes. For example, checkers displayed performance deficits in executive functions, specifically inhibition and cognitive flexibility, whereas washers did not (Omori et al., 2007) and in general checkers displayed greater cognitive impairment (Nedeljkovic et al., 2009).

Checking compulsions in OCD patients appear to reflect a distrust in a previous action and/or thought, thus checking and rechecking compensates for their own perceived uncertainty (Rachman & Shafran, 1998). For AN patients, idiosyncratic checking behaviors (e.g., pinching ones body to measure fatness) represent the same distrust regarding previous thoughts or behaviors. For example, an AN patient may consume a challenging food, and the check and recheck for changes in shape. From a cognitive–behavioral view, idiosyncratic checking behaviors serve the same purpose as compulsions in OCD by alleviating anxiety stemming from obsessions with weight and/or shape (Rosen, Reiter, & Orosan, 1995; Swinbourne & Touyz, 2007).

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http://dx.doi.org/10.1016/j.eatbeh.2014.08.003
1471-0153/

A better understanding of the links between AN and OC disorders may help explain the obsessive and compulsive tendencies, such as idiosyncratic BC, in AN patients. It is possible that the OC behaviors displayed in AN, especially idiosyncratic BC, may be a behavioral marker of similar cognitive differences seen in patients with OC disorders, specifically reduced cognitive inhibition.

To our knowledge, idiosyncratic BC behaviors as a behavioral indicator of reduced cognitive inhibition found in AN and OC patients have not been assessed. We therefore set out to compare the neuropsychological differences in AN patients with high and low levels of BC behaviors. The current study is a preliminary study, utilizing data from the Ravello Profile project (Stedal, Rose, Frampton, Landrø, & Lask, 2012; Rose, Davis, Frampton, & Lask, 2011), designed to examine one potential behavioral symptom indicating similarities in neuropsychological profiles of OC and AN patients. Based upon current knowledge of cognitive impairments found in checking behaviors and AN, our primary hypothesis is that patients with higher reports of BC would show more profound deficits in executive functions, specifically reduced cognitive inhibition. Our secondary hypothesis is that AN patients who reported more BC behaviors would report more frequent OC symptoms.

2. Method

2.1. Participants

Study participants were nine females, Caucasian in-patients at Huntercombe Hospital, Edinburgh, UK, meeting DSM-IV-TR diagnosis for anorexia nervosa. Diagnoses were completed by hospital psychiatrists. Ages ranged from 14 years to 17 years. Weight and height were measured during the week of the assessment; BMI's ranged from 11.50 to 16.40. All participants were English speakers.

Patients did not have any current or previous history of psychotic disorder, neurological disorder, current or past substance dependence or abuse. The primary diagnosis for all patients was AN. Written informed consent was obtained from all participants and participant carers.

All participants completed the Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994, 2008), Body Checking Questionnaire (BCQ; Reas et al., 2002) and age appropriate measures of obsessive–compulsive traits. Verbal and nonverbal intelligence was measured through the Matrix and Vocabulary Reasoning sections of the Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler, 1999). Table 1 summarizes the demographic, clinical, and cognitive characteristics of the sample.

Table 1
Participant demographic, clinical and intelligence scores.

Patient	Age (years)	BMI	EDEQ[a]	BCQ[a]	OCD[a]	WASI[a]	
						Matrix	Vocab
1	15	12.90	1.35	0.62	2.69	0.85	−0.13
2	16	14.20	2.01	1.59	3.51	0.85	0.39
3	17	15.30	−0.71	−1.31	2.48	0.08	−0.13
4	17	11.90	1.24	1.19	0.92	0.74	−0.55
5	16	11.50	2.21	4.49	3.51	1.63	0.59
6	14	12.80	0.25	4.09	4.00	−0.36	−1.49
7	17	16.10	2.82	4.01	6.78	0.30	0.49
8	16	16.40	2.46	4.73	7.43	−1.69	−0.55
9	16	13.70	1.32	2.48	4.32	−1.58	−0.55
Mean	16.00	13.89	1.44	2.43	3.96	0.09	−0.22
SD	1.00	1.77	1.12	2.07	2.05	1.13	0.66

Note. SD = Standard Deviation; BMI = Body Mass Index; EDEQ = Eating Disorder Examination Questionnaire; BCQ = Body Checking Questionnaire; OCD = Obsessive Compulsive Disorder Symptoms; WASI = Wechsler Abbreviated Scale of Intelligence.

2.2. Measures

2.2.1. Clinical measures

The Body Checking Questionnaire (BCQ; Reas et al., 2002) is a self report measure assessing the extent to which individuals regularly check the size and shape of their bodies, and includes subscales assessing overall appearance, specific body parts, and idiosyncratic checking, as well as a composite score. The BCQ has shown good internal consistency (Calugi, Grave, Ghisi, & Sanavio, 2006; Reas et al., 2002; Shafran, Fairburn, Robinson & Lask, 2004). The total scale score was used in the present study to determine high and low overall categories using a median split design.

Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994, 2008) is a self-report version of the Eating Disorder Examination interview, containing four subscales assessing the key cognitive features of eating disorders: Restraint, Eating Concern, Shape Concern, and Weight Concern (Berg, Peterson, Frazier, & Crow, 2011). The EDE-Q has shown excellent internal consistency and test–retest reliability (Berg et al., 2011; Luce & Crowther, 1999; Mond, Hay, Rodgers, Owen & Beumont, 2004).

2.2.2. Obsessive compulsive measures

2.2.2.1. Adolescents. Children Obsessive Compulsive Inventory (ChOCI; Shafran et al., 2004) is a self-report measure of obsessive–compulsive symptom severity and frequency for adolescents. The measure has shown to discriminate between children with OCD and healthy children and correlates with other adolescent OCD measures (Shafran et al., 2004).

2.2.2.2. Adults. Clark–Beck Obsessive Compulsive Scale (CBOCI; Clark & Beck, 2002) is a 25-item self-report measure that was developed to measures obsessive–compulsive symptoms in individuals 17 and older. The measure has shown strong convergent validity and internal consistency (Clark, Antony, Beck, Swinson, Steer, 2005).

2.2.3. Cognitive test battery

The cognitive set of tests, referred to as the Ravello Profile, is a neuropsychological battery developed as a universal battery to assess eating disorders (Rose, Davis, Frampton, & Lask, 2011). The current study was part of a larger study investigating the neuropsychological profile of anorexia nervosa. Details on the measures used in the current study are described below. For a full explanation of the battery please see Rose et al. and Stedal et al.

Delis–Kaplan Executive Function System (D-KEFS; Delis, Kaplan & Kramer, 2001) is a standardized set of tests to evaluate higher-level cognitive functions, mediated primarily by the frontal lobe, in both children and adults. The measure contains tests measuring cognitive inhibition, verbal inhibition, fluency, switching, flexibility and planning.

The Hayling and Brixton Tests (Burgess & Shallice, 1997) is a clinical assessment of executive function containing two tests, one measuring inhibition and the other set-shifting.

As recommended by Rose, Frampton, & Lask (2011), to assess for specific areas of executive function, composite *Z* scores were created for a measures of inhibition and is presented.

2.3. Procedure

Psychometric assessments and neuropsychological tasks were collected during the first two months of admission. A trained clinical psychologist and assistant psychologist administered the neuropsychological battery following the protocol of the battery creators (Rose et al., 2011).