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Research report

A preliminary investigation of a novel training to target cognitive biases towards negative social stimuli in Anorexia Nervosa

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ABSTRACT

Background: Patients with Anorexia Nervosa (AN) experience high levels of social difficulties and anxiety. These problems might be underpinned by negatively biased processing of social stimuli. The aim of this study was to examine the feasibility of using a novel Cognitive Bias Modification (CBM) training to target information processing biases in patients with AN.

Methods: Twenty-eight patients with AN completed a baseline and end of intervention assessment of mood and social appraisals. The CBM training consisted of 5 sessions and included an attentional probe task to train attention towards positive social stimuli and an ambiguous scenarios task to train benign or neutral interpretations of ambiguous social scenarios.

Results: At baseline patients displayed an attention and interpretation bias towards negative social stimuli. At the end of intervention there was a medium sized increase in attention to positive faces and fewer negative interpretations of ambiguous social stimuli. There were also lower levels of anxiety and higher levels of self-compassion in response to a judgemental video clip.

Limitations: The lack of a control group is the main limitation to this preliminary study as the changes obtained may have resulted from non-specific aspects of the inpatient treatment.

Conclusions: A novel CBM training is associated with more positive processing of social information in AN. It would be of interest to test the hypothesis that reducing cognitive biases towards social stimuli impacts on wider features of an eating disorder.

1. Introduction

Anorexia Nervosa (AN) is a serious mental illness characterised by severe restriction of food intake, dangerously low body weight and often, disturbed body image (American Psychiatric Association Workgroup on Eating Disorders , 2000). It has the highest mortality rates amongst psychiatric disorders (Chesney et al., 2014), with the highest risk observed in those with longest duration of illness (Franko et al., 2013). The median duration of illness is of 7 years (Støving et al., 2011) and longitudinal research highlights that fewer than 50% of individuals recover fully, 20–30% continue to experience residual symptoms, 10–20% remain significantly ill and 5–10% die from the illness (Steinhausen, 2002). Given the health-threatening consequences of malnutrition and emaciation, nutritional rehabilitation and weight restoration constitute the first step in the treatment for AN (National Institute for Health and Care Excellence, 2004). However, many patients admitted to inpatient care feel pressured or coerced to do so (Guarda et al., 2007). They are ambivalent about change and often terminate treatment prematurely (Woodside et al., 2004). This explains why hospital admissions for AN are repeated (Green and Griffiths, 2014; McCrone et al., 2008).

There is very little evidence that relates to the management of people with severe and enduring AN (Hay et al., 2012; Touyz et al., 2013; Wonderlich et al., 2012) who often have many comorbidities, including social anxiety (e.g. Hay et al., 2012; Sly et al., 2013; Stiles-Shields et al., 2013) and associated interpersonal difficulties (Arcelus et al., 2013; Swinbourne and Touyz, 2007). These difficulties interfere with treatment response and are accentuated by the neuroprogressive changes due to starvation (e.g. Treasure et al., 2014).

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Anxiety in AN is associated with more extreme physical exercise (Penas-Lledo et al., 2002), lower calorie intake (Steinglass et al., 2010), slower weight gain (Lockwood et al., 2012), impaired engagement in treatment (Goodwin and Fitzgibbon, 2002) and lower likelihood of recovery (Zerwas et al., 2013). Poor interpersonal skills and social adjustment also have a detrimental impact on treatment outcomes and illness prognosis (Goddard et al., 2013; Zucker et al., 2007) and predict mortality (Franko et al., 2013).

One of the candidate processes underlying socio-emotional difficulties and social anxiety in AN is the heightened sensitivity to negative social feedback (Rieger et al., 2010). According to this hypothesis, the increased sensitivity to negative social feedback might trigger eating disorder behaviours (e.g. dieting and restriction) as a means of gaining social acceptance and self-esteem and regulating negative emotions (Goss and Gilbert, 2002; Rieger et al., 2010).

Experimental studies have found that people with AN have an attentional bias towards rejecting faces and away from neutral and compassionate expressions (Cardi et al., 2014; Cardi et al., 2012). The stimuli in these studies were presented for 500 ms and the attentional bias found might have been underlined by threat detection mechanisms (Cisler and Koster, 2010). The use of longer stimuli presentation times could clarify whether patients also have difficulties in attentional control (i.e. if a difficulty to disengage attention from the stimuli at this later stage of visual processing was found) or emotion regulation (i.e. if later attentional avoidance was found; Cisler and Koster, 2010).

A recent study investigated the impact of CBM (Cognitive Bias Modification) of negative self-beliefs on eating disorder symptoms in a subclinical sample (Yiend et al., 2014). This study found that the directions (positive/neutral vs. negative) towards which negative self-beliefs were trained affected both self-report and behavioural measures of eating disorder-related symptoms (Yiend et al., 2014). In particular, a reduction in anxiety, depression and negative affect symptoms was reported after the positive/neutral training whereas an increase in depressive symptoms was found after the negative training (Yiend et al., 2014). Participants ate less during a test meal and reported more negative thoughts related to viewing themselves in the mirror after the negative training and fewer negative thoughts about weighing and viewing themselves in the mirror after the positive/neutral training (Yiend et al., 2014). Some training effects (i.e. changes in depression scores) were maintained at 1-week follow-up (Yiend et al., 2014). These findings indicate that trainings to reduce negative information biases in clinical cases may be of benefit.

In recent years, CBM procedures have been developed to reverse cognitive biases towards negative valenced information seen in anxiety and depression (e.g. Baert et al., 2011; Bar-Haim (2010); Beard et al., (2011); Hakamata et al., 2010; Hallion and Ruscio, 2011; Macleod (2012); Yiend et al., 2013). A recent meta-analysis indicates that CBM can remediate negative attention and interpretation biases towards emotionally relevant stimuli (e.g. facial expressions; emotionally valenced words) or anxiety- and depression-specific stimuli with a moderate sized effect in clinical and sub-clinical populations ($g=0.49$; Hallion and Ruscio, 2011). Benign interpretation training (i.e. training to interpret stimuli as non-threatening) is also associated with a significant increase in positive interpretation bias and decrease in negative mood in healthy controls and subclinical and clinical populations (Menne-Lothmann et al., 2014). The advantages of CBM are that they have the potential of being highly accessible and even self-administered. Also, they offer the opportunity to investigate specific cognitive mechanisms implicated in the maintenance of psychiatric symptoms.

The aim of this preliminary study was to test the feasibility of using a novel CBM procedure to train attention and interpretation towards benign social stimuli in a sample of patients with AN admitted to hospital. The impact on this training on anxiety and the reaction to critical feedback were also measured.

2. Methods

2.1. Participants

Thirty-two female patients suffering from AN and receiving inpatient treatment at the Bethlem Royal Hospital (SLaM, UK) were approached about the study. Inclusion criteria were: women aged between 18 and 55 years old, fluency in English, normal visual acuity, no motor impairment and no severe comorbidity (e.g. psychosis). Three participants declined to participate because of difficulties arranging regular appointments within a two-week time window. Twenty-nine participants decided to take part and completed the baseline assessment. One participant dropped out after the assessment session because of difficulties booking following appointments. Twenty-eight participants completed the intervention.

The study was reviewed by, and received ethical approval from, a National Health Service (NHS) Research Ethics Committee. Participants received full information about the study and provided informed written consent before participation.

2.2. Materials

2.2.1. Assessment

Participants completed a demographic questionnaire including questions on ethnicity, medication, visual impairment, neurological condition, employment status, current occupation, years of education, illness duration, highest/current/lowest body mass index (BMI) and comorbidity. They also completed a range of questionnaires and computerised tasks:

- Depression Anxiety Stress Scales (DASS; Lovibond and Lovibond, 1995)

This 21-item measure was administered at baseline and end of intervention to measure patients' levels of depression, anxiety and stress. The scale has been validated and found to possess good reliability with Cronbach's alpha to be 0.94 for Depression, 0.87 for Anxiety and 0.91 for Stress (Antony et al., 1998). The Cronbach's alphas in this study were: 0.93 for Depression, 0.81 for Anxiety, 0.77 for Stress and 0.91 for the Total Score.

- Short Evaluation of Eating Disorders (SEED; Bauer et al., 2005)

This measure was administered at baseline and end of intervention to measure eating disorder symptoms. The SEED is a 6-item questionnaire that allows for the calculation of two severity indexes for anorexia and bulimia nervosa symptoms. The validation study found that this short questionnaire was able to discriminate between eating disorder and non-eating disorder populations and that there were high levels of agreement between clinician and patient for the severity of AN symptoms (intra-class correlation=.077; Bauer et al., 2005). The AN symptoms assessed by the questionnaire are: degree of underweight, fear of weight gain and distortion of body perception. The Cronbach's alpha for this study was 0.67.

- Adult Rejection Sensitivity Questionnaire (A-RSQ; Downey and Feldman, 1996)