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Skin picking disorder with co-occurring body dysmorphic disorder

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ABSTRACT

There is clinical overlap between skin picking disorder (SPD) and body dysmorphic disorder (BDD), but little research has examined clinical and cognitive correlates of the two disorders when they co-occur. Of 55 participants with SPD recruited for a neurocognitive study and two pharmacological studies, 16 (29.1%) had co-occurring BDD. SPD participants with and without BDD were compared to each other and to 40 healthy volunteers on measures of symptom severity, social functioning, and cognitive assessments using the Stop-signal task (assessing response impulsivity) and the Intra-dimensional/Extra-dimensional Set Shift task (assessing cognitive flexibility). Individuals with SPD and BDD exhibited significantly worse picking, significantly worse overall psychosocial functioning, and significantly greater dysfunction on aspects of cognitive flexibility. These results indicate that when SPD co-occurs with BDD unique clinical and cognitive aspects of SPD may be more pronounced. Future work should explore possible subgroups in SPD and whether these predict different treatment outcomes.

Introduction

Skin picking disorder (SPD) is clinically defined in the DSM-5 as the repetitive or compulsive picking of skin to the point of causing tissue damage (American Psychiatric Association, 2013). Many individuals with SPD report that the behavior began with the onset of a dermatological condition such as acne (Wilhelm et al., 1999), but the picking continues even after the dermatological condition clears. Although the face is the most commonly reported site of picking, other areas, such as the hands, arms, and legs are also common targets. While most individuals with SPD pick at areas they can physically reach with their fingernails, they also report using a variety of utensils such as tweezers and pins to pick (Grant, Odlaug, & Kim, 2007). Individuals with SPD spend a significant amount of time picking their skin, with a mean of 2.8 hours each day spent resisting the urge to pick or picking (Flessner & Woods, 2006). The picking often leads to problems with self-esteem (Odlaug & Grant, 2010).

Although SPD is now a recognized mental illness, skin picking may also be a symptom of other psychiatric disorders. One such disorder is body dysmorphic disorder (BDD), characterized by obsessions about and preoccupation with perceived defects in physical appearance (American Psychiatric Association, 2013). Individuals with BDD may pick their skin in attempts to improve the appearance of perceived skin flaws. In fact, some type of skin picking behavior occurs in between 26 and 45% of patients with BDD (Grant, Menard, & Phillips, 2006). Conversely, an early study found that 11 (32%) of 34 SPD participants also met diagnostic criteria for BDD (Arnold et al., 1998). Thus, disproportionate obsessions over perceived skin problems and compulsive picking can create a complex diagnostic picture (for example, whether the symptoms indicate one diagnosis or the other, or a comorbidity). Although there appears to be clinical overlap between SPD and BDD, individuals with BDD pick at their skin to try to improve their appearance, whereas most individuals with SPD do not pick their skin because of their appearance and therefore would not meet criteria for BDD. It is possible, however, that a person may have co-occurring SPD and BDD. For example, a person may pick at their face to improve appearance and yet also pick at their legs in an automatic fashion with no obsessive thinking about the appearance of their legs.

Because the use of a clinical assessment to separate SPD from BDD often results in a confused diagnostic picture, neurocognitive assessments may allow for a more thorough examination of possible subtypes within SPD and shared pathophysiology between SPD and BDD. The repetitive physical symptoms of SPD suggest underlying dysfunction of motor inhibitory control processes. Similarly, the repetitive mirror checking and picking to improve appearance often seen in BDD may also suggest problems with motor inhibition. Motor impulsivity is classically assessed using tasks that require individuals to make simple motor responses on some computer

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trials but not others. Response inhibition as a cognitive function is dependent on neural circuitry that includes the right inferior frontal gyrus (Aron, Fletcher, Bullmore, Sahakian, & Robbins, 2003). Data are conflicting, however, in SPD with one study using a stop-signal task indicating impaired stop-signal inhibitory control in patients with SPD compared to healthy volunteers and intact cognitive flexibility (Odlaug, Chamberlain, & Grant, 2010) while a later study found no motor inhibitory deficits in SPD versus controls (Snorrason, Smári, & Ólafsson, 2011).

Cognitive tasks studied in SPD have not been similarly performed in individuals with SPD and co-occurring BDD, and this comorbidity may explain some of the conflicting results seen in SPD studies. Scant research has focused on the neurocognition of BDD. One study found that participants with BDD exhibited deficits in cognitive flexibility (Jefferies, Laws, & Fineberg, 2010). Another small study using the Rey-Osterrieth Complex Figure Test (a task that evaluates visuospatial abilities, memory, attention, planning, and working memory), however, found that individuals with BDD alone ($n = 17$) exhibited deficits in organizational strategies compared to controls (Deckersbach et al., 2000). Other research suggests that individuals with BDD may have abnormalities in visual processing (Feusner et al., 2010; Yaryura-Tobias et al., 2002). Cognitive testing of motor inhibitory deficits in BDD, however, is currently lacking.

Although SPD and BDD have clinical overlap, the neurocognitive research of SPD and BDD has to date failed to provide clarity regarding the differences or similarities of these disorders. This may be because SPD comprises a heterogeneous illness, and the co-occurrence of SPD with BDD may be one important subtype of SPD. To help clarify the heterogeneity of SPD, we have chosen objective neurocognitive tasks hypothesized to reflect impairments in motor inhibition and cognitive flexibility which are dependent upon integrity of frontal–striatal circuitry. Thus, the aims of the current study were to examine the previously unstudied questions concerning clinical and cognitive differences between individuals with SPD and those with SPD co-occurring with BDD. In terms of clinical variables, we hypothesized that SPD co-occurring with BDD would result in more severe skin picking, greater psychosocial dysfunction and worse quality of life. In terms of cognitive variables, we hypothesized that the co-occurrence of SPD and BDD would result in greater motor impulsivity as indexed by the stop-signal paradigm, but intact set-shifting.

Method

Participants

The sample consisted of 39 participants with SPD (mean age 34.1 ± 11.7 years; 92.3% female), 16 participants with SPD and current BDD (mean age 33.6 ± 8.1 years; 81.3% female) (these were the only participants who also met criteria for lifetime BDD), and 40 healthy controls with no psychiatric history (mean age 31.2 ± 9.8 years; 87.5% female). The only inclusion criterion was that participants were required to have a current DSM-5 diagnosis of SPD (American Psychiatric Association, 2013). Healthy controls were required to have no lifetime or current psychiatric illness. Participants were diagnosed with BDD using the Body Dysmorphic Disorder Questionnaire (BDDQ; Phillips, 1996) a self-report screening measure of BDD which was then followed by a detailed psychiatric interview confirming the diagnosis and by the use of the Structured Clinical Interview for DSM-IV disorders (SCID).

SPD participants were recruited from the community for a variety of ongoing research studies (cognitive, neuroimaging, and treatment) beginning in 2012 and currently still recruiting (participants recruited prior to 2013 were retrospectively re-evaluated with DSM-5 criteria). Participants were recruited via fliers and newspaper advertisements. The healthy volunteers were recruited from the community using media advertisements. Lifetime and past 12-months co-occurring psychiatric disorders were assessed by board-certified psychiatrists using the Structured Clinical Interview for DSM-IV disorders (SCID) (First, Spitzer, Gibbon, & Williams, 1995). Participants were excluded if they were unable to understand and consent to the study procedures or had a history of neurological disorders. No participants were excluded based on this criterion.

The Institutional Review Board of the University of Chicago approved the studies and the informed consent statements. After study procedures were explained and participants had the opportunity to ask questions, all study participants provided voluntary written informed consent. All study procedures were carried out under the guidance of the latest version of the Declaration of Helsinki. All study procedures were carried out in a single visit and participants were reimbursed $25 for their travel and time.

Clinical Measures

All participants with SPD were assessed for the severity of their picking and related mental health symptoms. The severity of SPD was assessed using the *Yale Brown Obsessive Compulsive Scale Modified for Neurotic Excoriation (NE-YBOCS)* (Arnold et al., 1999; Grant et al., 2007) and the *Clinical Global Impressions – Severity (CGI-S) Scale* (Guy, 1976).

Psychosocial functioning and depressive and anxiety symptoms were further assessed using the following valid and reliable measures: the patient-administered *Sheehan Disability Scale (SDS)* (Sheehan, 1983), the clinician-administered *Hamilton Anxiety Rating Scale (HARS)* (Hamilton, 1959) and *Hamilton Depression Rating Scale (HDRS)* (Hamilton, 1960). In addition, the *Quality of Life Inventory (QoLI)* (Frisch, Cornell, Villanueva, & Retzlaff, 1992) was used to examine overall satisfaction in a variety of life domains.

Cognitive Measures

SPD participants as well as healthy controls undertook paradigms from the Cambridge Neuropsychological Test Automated Battery (CANTAB) (Cambridge Cognition Limited, 2006) quantifying aspects of impulsivity (relating to response inhibition) and cognitive flexibility. The *Stop-Signal Task (SST)* is a well-validated task quantifying the ability to suppress impulsive responses (Aron, Robbins, & Poldrack, 2004; Logan, Cowan, & Davis, 1984). Participants observe a series of directional arrows appearing one at a time on a computer screen, and make speeded motor responses depending on the direction of each arrow, with a button box (left or right). On a subset of trials, an auditory beep occurs (the 'stop-signal') which indicates that the subject should try to inhibit their response for that particular trial. The task adjusts the gap between the 'go' and 'stop' signals dynamically depending on the individual's performance, such that the likelihood of successful inhibition over the whole of the task approximates 50%. The primary outcome measure is a sensitive estimate of the time taken by the subject's brain to stop a pre-potent response, referred to as the 'Stop-signal reaction time' (SSRT). Median reaction time for go trials is also recorded, along with the number of directional errors.

The *Intra-dimensional/extra-dimensional set shift task (IDED)* includes aspects of rule learning and behavioral flexibility, and was derived from the Wisconsin Card Sort Test (Lezak, Howieson, & Loring, 2004). Through trial and error, and feedback, volunteers attempt to learn a rule about which one of the two stimuli is correct. After each choice, feedback is given ('correct' or 'incorrect'). Once learning criterion is obtained (six consecutive correct responses), the computer changes the rule, and the volunteer must then adapt