

Impulse control disorders in non-treatment seeking hair pullers

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Background and aims: Hair pulling is a common body focused repetitive behavior. The purpose of this paper is to examine the prevalence of impulse control disorders (as defined in DSM-IV-TR) in a non-treatment seeking sample of hair pullers. **Methods:** 1,717 college students with ($n = 44$) and without ($n = 1673$) hair pulling completed a mental health survey. The college students were sent an online survey assessing hair pulling behavior and other impulse control disorders using the Minnesota Impulsive Disorders Interview. **Results:** Students with hair pulling were significantly more likely to have a co-occurring impulse control disorder (20.5% vs. 8.9%, $p = 0.009$, OR = 2.71, CI = 1.28–5.75) and were significantly more likely to meet criteria for compulsive buying, compulsive sexual behavior and intermittent explosive disorder than students without hair pulling. Differences seemed to be moderated by the male gender among students with hair pulling. **Discussion and conclusions:** Hair pulling is often comorbid with another impulse control disorder, which suggests that elements of impulsivity may be important in our understanding of hair pulling. Furthermore, gender may moderate impulse control comorbidity in hair pulling disorder.

Keywords: hair pulling disorder, impulse control disorders, comorbidity

INTRODUCTION

Hair pulling is a fairly common body focused repetitive behavior which, at a pathologic level, can result in distress or functional impairment (American Psychiatric Association, 2013). Approximately 2.5% to 9.7% of college students report visible hair loss due to hair pulling (Christenson, Pyle & Mitchell, 1991; Duke, Keeley, Ricketts, Geffken & Storch, 2010; Odlaug & Grant, 2010). Previous research has reported high rates of mental health issues in college students who pull their hair (Christenson et al., 1991; Mansueto, Thomas & Brice, 2007; Sulkowski, Mariaskin & Storch, 2011); however, no research has investigated the rates of impulse control disorders (as defined by DSM-IV-TR; American Psychiatric Association, 2000) in non-treatment seeking hair pullers using a college sample.

For the present study, we sought to examine the prevalence of impulse control disorders in a non-treatment seeking sample of individuals within hair pulling. Based on research in hair pulling that has found high levels of cognitive impulsivity (Flessner, Knopik & McGeary, 2012), we hypothesized that individuals who pull their hair would report higher rates of impulse control disorders compared to non-pullers. We also hypothesized that gender may moderate the rates of comorbid impulse control disorders within hair pullers, based on research finding higher rates of OCD and tics in males with hair-pulling compared with females (Christenson, Mackenzie & Mitchell, 1994; Lochner, Seedat & Stein, 2010). In specific, we wanted to examine comorbidity based on gender and hypothesized that males with hair pulling would report higher rates of impulse control disorders compared to females.

METHODS

Survey description

Between the months of April and May of 2011, a random sample of 6,000 students enrolled in a large Midwestern university received an e-mail inviting them to participate in a large online survey regarding impulse control disorders. Student names were randomly generated from a list of enrolled undergraduate and graduate students at the university during the spring of 2011. Consent to the survey required that students read through an introductory page with IRB-approved language about survey content, which indicated that the survey was completely voluntary, and then click on the link labeled 'begin survey.' Weekly drawings of portable music players and a final drawing for gift cards of \$250, \$500, and \$1,000 were offered as an incentive for students to enroll in the survey. The study procedures were carried out in accordance with the Declaration of Helsinki. The Institutional Review Board of the University of Minnesota approved the study and the consent statement.

Assessments

After agreeing to participate in the study, students were asked, "Have you ever pulled out scalp, eyelash, eyebrow,

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pubic or any other body hair other than for cosmetic reasons?" Since almost everyone has probably pulled a hair at some point in their lives, and because we did not want to pathologize normal behavior, we asked students who endorsed hair pulling, the follow-up question of: "Has hair pulling ever resulted in visible hair loss such as hair thinning, bald patches, or in the case of eyelashes, gaps along the eyelid?" This question was used as a proxy measure of whom we characterize as "hair pullers."

Impulse control disorders were assessed by the Minnesota Impulsive Disorders Interview (MIDI; Grant, 2008). The MIDI has good diagnostic validity and reliability when used as a self-report measure (Odlaug & Grant, 2010). The impulse control disorders assessed by the MIDI include pathological gambling, compulsive shopping, intermittent explosive disorder, kleptomania, compulsive sexual behavior and pathological skin picking.

Statistical analysis

The original sample was 2,108 students (35.1% response rate). This response rate is commensurate with other national health surveys (Baruch & Holtom, 2008; Van Horn, Green & Martinussen, 2009). The sample was limited to the 1,717 students who answered either yes or no to the question of "Have you ever pulled out scalp, eyelash, eyebrow, pubic or any other body hair other than for cosmetic reasons?" and the question "Has hair pulling ever resulted in visible hair loss such as hair thinning, bald patches, or in the case of eyelashes, gaps along the eyelid?" Categorical variables were compared using chi-square testing or Fisher's exact tests where appropriate. Odds ratios and confidence intervals were completed on significant variables. Multiple comparisons of the 6 impulse control disorders were separately controlled for by using the Holm sequentially rejective multiple test procedure (Holm, 1979).

RESULTS

Forty-four students (2.6% of the 1,717 students) reported hair pulling with visible hair loss. Of the females, 3.5% reported hair pulling; and of the males, 1.4% reported hair pulling. Most demographic variables did not differ between hair pulling groups. Males were significantly less likely to report hair pulling (Table 1). Of the 44 individuals with hair pulling, 9 (20.5%) met criteria for at least one impulse control disorder, compared to 145 (8.9%) of students who did not pull their hair ($p = 0.009$) (see Table 2). Students reporting hair pulling were 2.71 times more likely to have an impulse control disorder (CI = 1.28–5.75) compared to those not reporting hair pulling. Males with hair pulling also reported significantly more impulse control disorders compared to men without hair pulling ($p = 0.002$) (see Table 2) and were 8.24 times more likely to report an impulse control disorder (CI = 2.25–30.14). Of the hair pullers, 5 (11.4%), 3 (6.8%), and 1 (2.3%) met criteria for 1, 2, and 3, respectively, impulse control disorders. In contrast, 127 (7.8%), 15 (0.9%), and 3 (0.2%) of non-hair pullers, met criteria for 1, 2, or 3 impulse control disorders, respectively.

In terms of specific impulse control disorders, we found that all students and in specific, males with hair pulling endorsed significantly higher rates of intermittent explosive disorder, compulsive shopping, and compulsive sexual be-

havior compared to their non-pulling counterparts (Table 2). Students with hair pulling were 4.80 (CI = 1.77–12.85) times more likely to have compulsive shopping, 26.51 (CI = 4.31–162.83) times more likely to have intermittent explosive disorder, and 4.15 (CI = 1.21–14.17) times more likely to have compulsive sexual behavior compared to non-pull-

Table 1. Demographics of university students with and without hair pulling

	Hair pulling (<i>N</i> = 44)	No hair pulling (<i>N</i> = 1673)	Statistic	Non-adjusted <i>p</i> -value
Age, mean (\pm <i>SD</i>)	22.14 (7.6)	21.72 (2.9)	$t = 0.923$	0.356
[range], years	[18–29]	[18–30]	$df = 1715$	
Sex, <i>n</i> (% male)	10 (22.7)	695 (41.5)	$\chi^2 = 6.27$	0.01 ^a
Race/ethnicity, <i>n</i> (%)				
Caucasian	38 (86.4)	1333 (79.7)	$\chi^2 = 1.19$	0.275
Marital status, <i>n</i> (%)				
Single/divorced/ widowed/separated	24 (54.5)	1025 (61.4)		
Married/partner/ engaged/committed	20 (45.5)	645 (38.6)	$\chi^2 = 0.843$	0.359

Notes: ^a Significant using Holm sequentially rejective adjustment

Table 2. Lifetime impulse control diagnosis based on the MIDI in relation to hair pulling

	Hair pulling All students (<i>N</i> = 44)	No hair pulling All students (<i>N</i> = 1673)		
	Males (<i>N</i> = 10)	Males (<i>N</i> = 695)		
	Females (<i>N</i> = 34)	Females (<i>N</i> = 978)	Statistic	<i>p</i> -value
Any impulse control disorder				
All students	9 (20.5)	145 (8.9)	χ^a	0.009
Male	4 (40.0)	52 (7.5)	χ^b	0.002
Female	5 (14.7)	93 (9.5)	χ^c	0.332
Pathological gambling				
All students	1 (2.3)	11 (0.7)	<i>f</i>	0.270
Male	1 (10.0)	9 (1.3)	<i>f</i>	0.135
Female	0 (0.0)	2 (0.2)	<i>f</i>	1.000
Compulsive shopping				
All students	5 (11.4)	58 (3.5)	<i>f</i>	0.020 ^e
Male	2 (20.0)	16 (2.3)	<i>f</i>	0.025 ^d
Female	3 (8.8)	42 (4.3)	<i>f</i>	0.189
Intermittent explosive disorder				
All students	2 (4.5)	3 (0.2)	<i>f</i>	0.006 ^e
Male	1 (10.0)	1 (0.1)	<i>f</i>	0.028 ^d
Female	1 (2.9)	2 (0.2)	<i>f</i>	0.098
Kleptomania				
All students	0 (0.0)	0 (0.0)		
Compulsive sexual behavior				
All students	3 (6.8)	29 (1.7)	<i>f</i>	0.047 ^d
Male	3 (30.0)	16 (2.3)	<i>f</i>	0.002 ^e
Female	0 (0.0)	13 (1.3)	<i>f</i>	1.000
Pathological skin picking				
All students	3 (6.8)	70 (4.2)	<i>f</i>	0.432
Male	0 (0.0)	14 (2.0)	<i>f</i>	1.000
Female	3 (8.8)	56 (5.7)	<i>f</i>	0.444

Notes: All values are *n* (%); χ^a : Chi-squared value of 6.91; χ^b : Chi-squared value of 13.64; χ^c : Chi-squared value of 0.92; *f*: Fisher's exact test; ^d Significant at $p = 0.05$; ^e Significant using Holm sequentially rejective adjustment.

MIDI = Minnesota Impulsive Disorders Interview.

ing individuals. Males with hair pulling, were 10.61 (CI = 2.08–53.98) times more likely to have compulsive shopping, 77.11 (CI = 4.46–1331.46) times more likely to have intermittent explosive disorder, and 18.19 (CI = 4.31–76.80) times more likely to have compulsive sexual behavior compared to non-pulling males. Rates of pathological gambling, compulsive shopping, kleptomania, and pathological skin picking did not differ between groups.

DISCUSSION

This study found that 2.6% of university students pulled their hair, a prevalence rate comparable to those previous reported in university samples (Christenson et al., 1991; Odlaug & Grant, 2010; Sulkowski et al., 2011). Consistent with past studies (Diefenbach, Tolin, Hannan, Crocetto & Worhunsky, 2005; Franklin, Edson, Ledley & Cahill, 2011; Grant, Odlaug & Chamberlain, 2011; Lochner, Simeon, Niehaus & Stein, 2002; Miltenberger, Rapp & Long, 2001; Odlaug & Grant, 2008, 2010), we found a higher prevalence of hair pulling in females (3.5% in females; 1.4% in males).

An important finding of this study is that individuals classified as hair pullers had significantly higher rates of impulse control disorders compared to those without hair pulling, and that approximately one in five students with hair pulling had at least one co-occurring impulse control disorder. Cognitive research has demonstrated elevated levels of impulsivity among people with hair pulling (Chamberlain, Fineberg, Blackwell, Robbins & Sahakian, 2006). However, recently in DSM-5, hair pulling disorder was removed from the impulse control disorders category and placed in the chapter with obsessive compulsive disorder (OCD) (American Psychiatric Association, 2013). This change was based on clinical similarities and possibly shared neurobiology between hair pulling disorder and OCD (Bienvenu et al., 2012). The literature on the relationship between hair pulling and OCD, however, is far from conclusive. Interestingly, rates of co-occurring OCD among people who pull their hair (2.3% of hair-pullers self-reported OCD in the current study [data not presented]) are actually lower than rates of impulse control disorders found in this study (20.5%). Thus, our findings may challenge the DSM-5 categorization of hair pulling disorder to align with OCD, suggesting that hair pulling may have as much if not more in common with impulse control disorders. A full understanding of hair pulling and its proper categorization, therefore, requires further examination of hair pulling's relationship to impulsive disorders.

These data are interesting and clinically important due to the gender findings. Males with hair pulling reported significantly higher rates of impulse control disorders than males without hair pulling. In fact, the differing rates of co-occurring impulse control disorders in the larger sample seem to be almost completely a product of gender. However, these findings need to be cautiously interpreted, since only four males with hair pulling reported impulse control disorders. Yet, the results may suggest that hair pulling among males reflect a different neurobiology than in females. They also raise questions about the degree of impulsivity and compulsivity underlying hair pulling behavior (Chamberlain, Odlaug, Boulougouris, Fineberg & Grant, 2009) and

whether and to what extent gender is associated with the domains of compulsivity and impulsivity. Gender may perhaps play a role in the heterogeneous presentation seen in individuals with hair pulling.

One unexpected finding in this study was that rates of pathological skin picking did not differ between those with and without hair pulling. Most studies that have found high co-occurrence rates between these behaviors have been in clinical samples (most however did not use comparison groups) (Snorrason, Belleau & Woods, 2012). For example, one study of 110 university students with and without skin picking found higher rates of hair pulling in the picking group (Snorrason, Smári & Ólafsson, 2011). This comorbidity research, in addition to an extensive body of phenomenology research (Chamberlain et al., 2009; Grant et al., 2012), has generally supported the claim that hair pulling and skin picking share clinical and probably neurobiological similarities. Based on this research, we would have expected higher rates of picking in the hair pulling group. The fact that we did not, may suggest several possible conclusions: the two behaviors although similar are not identical; that our definition of hair pulling for this study was not as rigorous as the diagnosis of trichotillomania in previous studies; and that again, gender may be an important moderating variable when comparing these behaviors.

Despite the large sample size and detailed questionnaires, several limitations exist within this study. This study relied on self-report data collected via an anonymous Internet survey and subjects were not clinically evaluated. This methodology may have lead to under or over reporting of rates of hair pulling, as well as impulse control disorders. Second, these findings were not based on clinical assessment; therefore, these findings may not accurately generalize to individuals clinically diagnosed with hair pulling. Additionally, this sample was derived from students attending a large, relatively racially and ethnically homogeneous Midwestern university and may not generalize to individuals outside of this demographic. Finally, our gender related claims are based on four males with self-reported hair pulling and impulse control disorders. Thus, these gender-related findings may under- or over-estimate the role that gender plays in impulse control disorders in a hair pulling sample.

CONCLUSIONS

Overall, this study suggests that hair pulling is relatively common within college populations and that individuals, especially males, with hair pulling have higher comorbid rates of impulse control disorders compared to their counterparts. Further longitudinal studies are needed to observe the relationship between hair pulling and the comorbidity and pathogenesis of mental health related problems, as well as assessing the role of gender. Our results suggest that mental health care providers may want to screen their clients for hair pulling (such as asking about non-cosmetic hair pulling resulting in hair loss), because this behavior may indicate the presence of comorbid impulse control disorder related issues and in particular in males, may suggest other problems with impulsivity or compulsivity.

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