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Short communication

Differential parental influence in the familial aggregation of obsessive compulsive disorder

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ABSTRACT

The familial nature of OCD has been well established. Clinical characteristics such as early age of onset, comorbidity with tic disorders, and higher rates of symmetry symptoms have been associated with the familial aggregation of OCD, though little research has examined the differential impact of paternal and maternal OCD. The current study explored parental influence on the expression of these characteristics and reports on 310 probands diagnosed with OCD as well as 1580 of their biological first-degree relatives. The probands were evaluated by trained clinical raters using semi-structured assessments, and relative diagnoses were obtained based on probands' reports. Similar to previous findings, 10.13% of the 1580 relatives ($n=160$) were reported to have significant OCD symptoms. Only probands who reported having a father with OCD, rather than any first-degree relative, were more likely to have an early age of onset, symmetry and exactness obsessions, and higher rates of comorbidity. No significant differences were found with respect to the probands who reported their mothers as having OCD. These findings suggest that paternal OCD, rather than simply any first-degree relative having OCD, may influence whether probands exhibit the clinical characteristics commonly associated with the familial subtype of OCD.

1. Introduction

Obsessive–compulsive Disorder (OCD) is a psychiatric condition characterized by recurrent intrusive thoughts (obsessions) and ritualistic behaviors (compulsions) that occur in approximately 2–3% of the general population (Karno, Golding, Sorenson, & Burnam, 1988). It is considered to be among the 10 most disabling medical conditions worldwide by the World Health Organization (Murray & Lopez, 1996) with 21% of cases beginning before age 10 (Kessler et al., 2005). The course of OCD is chronic (Eisen et al., 2013) and typically results in serious social and occupational impairment (Pinto, Mancebo, Eisen, Pagano, & Rasmussen, 2006). This is particularly true for those diagnosed with OCD at an early age (i.e., onset prior to 18 years of age), as they tend to exhibit more severe symptoms as well as more compulsive behavior (Geller et al., 1998; Stewart et al., 2004; Rosario-Campos et al., 2001). This has led many researchers to investigate genetic and familial factors that may increase the risk for developing early onset OCD.

Several twin and family studies have been conducted to examine the heritability of OCD. One adult twin study reports that genetics account for 33% and 26% of symptom transmission (obsessions and compulsions, respectively; Jonnal, Gardner, Prescott, & Kendler, 2000), while other studies estimate the heritability to be has high as 47% (Clifford, Murray, & Fulker, 1984). Family studies have consistently provided evidence that OCD occurs more frequently in the first degree relatives of OCD probands than in the general population (Nestadt et al., 2000; Pauls, Alsobrook, Goodman, Rasmussen, & Leckman, 1995) and a meta-analysis of five OCD family studies found the summary odds ratio (OR) of relatives of OCD probands having significant OCD symptoms to be 4.0 as compared to the relatives of controls (Hettema, Neale, & Kendler, 2001). In addition to finding a familial aggregation of OCD, Pauls et al. (1995) and Nestadt et al. (2000) showed that probands with higher rates of OCD among their relatives typically had an earlier age of onset. Remarkably, the family study by Nestadt et al. (2000) found that not a single case of OCD was reported in the relatives of probands diagnosed with late onset OCD (i.e., onset ≥ 18). Furthermore, the most recent multigenerational family clustering study designed to address many of the limitations of earlier research found that additive genetic factors account for 47% of the familial risk apart from environmental factors and that this risk is higher among probands diagnosed before age 18, though not significantly so (Mataix-Cols et al., 2013).

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In addition to research suggesting that early onset OCD is familial, extant research suggests that early onset OCD is a subgroup with its own unique set of characteristics and comorbid presentation. Several studies have pointed to a higher incidence of tics and Tourette's disorder among those diagnosed with early onset OCD (Grados et al., 2001; Leonard et al., 1992; Chabane et al., 2005; Millet et al., 2004; Diniz et al., 2004; Janowitz et al., 2009). Research has also demonstrated that tics and Tourette's disorder occur more frequently among the first degree relatives of those diagnosed with early onset OCD (Grados et al., 2001; Geller et al., 1998; Pauls et al., 1995; Hanna, Himle, Curtis, & Gillespie, 2005) as well as higher rates of OCD among the family members of probands with comorbid OCD and Tourette's disorder (Chabane et al., 2005; Leonard et al., 1992). Such findings have led researchers to suggest that a bidirectional relationship exists between OCD and tics among the family members of OCD probands (Hanna et al., 2005).

Additional factors such as symptom presentation have been associated with the familial aggregation of OCD. Although only a small number of studies have examined familial transmission of specific symptoms, the available research points to a higher incidence of symmetry obsessions among those with familial OCD. Alsobrook, Leckman, Goodman, Rasmussen, and Pauls (1999) performed a segregation analysis indicating that relatives were at an increased risk for OCD when OCD probands scored higher for symmetry and ordering symptoms. Another study found that among early onset OCD probands with ordering compulsions, 45.4% of their first-degree relatives indicated definite or subthreshold OCD symptoms versus only 18.8% of the relatives of probands without ordering compulsions (Hanna et al., 2005). These findings suggest that early onset OCD may have a unique symptom presentation in addition to being comorbid with tic disorders.

Among other psychiatric illnesses, age of onset has been used to identify sub-groups with more severity, comorbidity, and greater hereditability. For example, childhood onset schizophrenia has been associated with greater severity ratings (Gordon et al., 1994) and higher heritability compared to adult onset schizophrenia (Gorwood, Leboyer, Jay, Payan, & Feingold, 1995). Similar findings have been noted for bipolar disorder (Carter, Mundo, Parikh, & Kennedy, 2003; Somanath, Jain, & Reddy, 2002) leading researchers to suggest that early onset Bipolar disorder should be categorized as a specific subgroup of the disorder (Bellivier et al., 2003). In searching for factors that could increase the risk for developing these neuropsychiatric disorders, researchers have also begun investigating the role of advanced parental age, particularly with regard to the age of the father at the time of the proband's birth. It is suggested that advanced paternal age increases the likelihood of inheriting de novo spermatogonia mutations that place offspring at an elevated risk for developing schizophrenia (Byrne, Agerbo, Ewald, Eaton, & Mortensen, 2003; Malaspina et al., 2001), bipolar disorder (Frans et al., 2008), and autism spectrum disorders (Reichenberg et al., 2006). A recent study by Wu et al. (2012) found that advanced paternal age increased the relative risk of offspring developing OCD by an OR of 2.22 for father's aged 30–34 and an OR of 5.41 for father's older than 35. However, a recent multi-generational family aggregation study in Denmark identified advanced maternal age (OR = 1.25), rather than paternal age, as a significant risk factor for the development of OCD (Steinhausen, Bisgaard, Munk-Jørgensen, & Helenius, 2013). These conflicting findings as to the role of parental age in the heritability of OCD warrant further investigation. Considering that early onset OCD is associated with the familial aggregation of OCD symptoms and advanced parental age could play a role in the heritability of the disorder, it is possible that advanced parental age may be a risk factor for the development of early onset OCD.

The purpose of this study is to further elucidate the clinical characteristics associated with the familial aggregation of OCD as well as to investigate the role of paternal versus maternal OCD in the development of early onset OCD symptoms. Consistent with previous research, we expected that patients with early onset OCD would be more likely have first degree relatives with significant OCD symptoms. We also predicted that the probands with relatives affected by OCD would demonstrate a higher prevalence of tic disorders as well as symmetry and ordering symptoms. In addition, we explored the association of parental age with early age of OCD onset to investigate possible increased risk associated with advanced parental age.

2. Method

2.1. Participants

The current study reports on 310 adult probands enrolled in the Brown Longitudinal Obsessive–Compulsive Study (BLOCS), a NIMH funded naturalistic prospective study on the course of OCD, as well as 1580 of their biological first-degree relatives. Probands were included in the study if they had a primary DSM-IV diagnosis of OCD (i.e., OCD was the disorder that participants identified as causing the most problems over their lifetime), were at least 19 years old, had sought treatment for OCD within the past 5 years, and were willing and able to sign written consent. The only exclusion criterion was the presence of an organic mental disorder. Demographic and clinical characteristics of this sample are consistent with other OCD samples, including the DSM-IV field trial (Foa & Kozak, 1995; Rasmussen & Tsuang, 1986). A detailed description of the BLOCS sample, recruitment methods, and study procedures can be found elsewhere (Pinto et al., 2006).

2.2. Procedure

Participants were recruited from several psychiatric treatment settings in Rhode Island and Southeastern Massachusetts. Specific recruitment sites included a hospital-based outpatient OCD clinic, inpatient and partial hospitalization units of a private psychiatric hospital, two community mental health centers, three private practice psychotherapy sites specializing in OCD treatment, as well as a general outpatient psychiatric group practice. This study was approved by the Institutional Review Boards of Butler Hospital and Brown University. Once written informed consent was obtained, probands were interviewed directly by trained clinical interviewers at study intake. Family history data concerning each first-degree relative was collected at intake, and participants also completed a battery of self-report measures during the interviews.

2.3. Assessments

The Structured Clinical Interview for DSM-IV Axis I Disorders-Patient Edition (First, Spitzer, Gibbon, & Williams, 1996) was used to establish diagnoses at intake. Demographic and clinical information was collected using the Butler Hospital OCD Database, a semi-structured rater-administered interview (Rasmussen, 1993). OCD symptoms and severity were evaluated using the Yale-Brown Obsessive–Compulsive Scale (Y-BOCS), a reliable and valid 10-item rater-administered scale and the Y-BOCS Symptom Checklist (Goodman et al., 1989a, 1989b). Axis I diagnoses and Y-BOCS total scores in this study have been found to have good to excellent interrater reliability as reported by Eisen et al. (2010).

Family history data concerning each biological first-degree relative were collected from the probands during the intake interview or subsequent follow-up interviews. The family history of OCD was obtained using a semi-structured family screening form. Probands were asked to consider each of their first-degree relatives and report their experience of obsessions, compulsions, the time occupied by their symptoms, as well as distress and impairment they perceived to be attributable to OCD. Interviewers made best-estimate diagnoses for the relatives of the probands based on DSM-IV criteria using the information provided by the OCD probands. If a first-degree relative had ever been diagnosed with OCD or the proband described symptoms that appeared to meet key diagnostic criteria (i.e., duration, impairment or distress), a “definite” diagnosis was assigned. If a relative appeared to exhibit clear symptoms of OCD but key diagnostic criteria were unknown based on the proband's report, the interviewer assigned them a “probable” diagnosis. If probands reported their relative to exhibit possible symptoms of a disorder but they were unsure of the diagnostic criteria, they were assigned a “possible” diagnosis, and if they reported no symptoms, “no” diagnosis was coded. In some cases probands could not provide enough information to make an informed decision regarding their relatives' diagnoses, in which case interviewers regarded this as missing data ($n = 15$).