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The Relationship of Hypochondriasis to Anxiety, Depressive, and Somatoform Disorders

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Abstract

Background—Though the phenotype of anxiety about medical illness has long been recognized, there continues to be debate as to whether it is a distinct psychiatric disorder and, if so, to which diagnostic category it belongs. Our objective was to investigate the pattern of psychiatric co-morbidity in hypochondriasis and to assess the relationship of health anxiety to anxiety, depressive, and somatoform disorders.

Methods—Data were collected as part of a clinical trial on treatment methods for hypochondriasis. 194 participants meeting criteria for DSM-IV hypochondriasis were assessed by sociodemographic variables, results of structured diagnostic interviews, and validated instruments for assessing various symptom dimensions of psychopathology.

Results—The majority of individuals with hypochondriasis had co-morbid psychiatric illness; the mean number of co-morbid diagnoses was 1.4, and 35.1% had hypochondriasis as their only diagnosis. Participants were more likely to have only co-morbid anxiety disorders than only co-morbid depressive or somatoform disorders. Multiple regression analysis of continuous measures of symptoms revealed the strongest correlation of health anxiety with anxiety symptoms, and a weaker correlation with somatoform symptoms; in multiple regression analysis, there was no correlation between health anxiety and depressive symptoms.

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Conclusion—Our findings suggest that the entity of health anxiety (Hypochondriasis in DSM-IV, Illness Anxiety Disorder in DSM-5) is a clinical syndrome distinct from other psychiatric disorders. Analysis of co-morbidity patterns and continuous measures of symptoms suggest its appropriate classification is with anxiety rather than somatoform or mood disorders.

Keywords

Hypochondriasis; Illness Anxiety Disorder; Somatic Symptom Disorders; Anxiety Disorders

Introduction

The nosological status of hypochondriasis has long been a matter of debate. In DSM-IV, hypochondriasis (HC) is defined as a diagnosis whose cardinal feature is severe and persistent anxiety about the presence of undiagnosed medical illness, and it is included in the somatoform disorders section. In DSM 5, its derivative, termed illness anxiety disorder (IAD), is retained in the Somatic Symptom and Related Disorders section. However, questions remain whether it is better classified as an anxiety disorder or a disorder of somatization. Its classification with somatic symptom and related disorders suggests that HC is fundamentally a disorder of somatic experience, thoughts about disease, and somatic attributional errors. But it is possible that HC is more properly considered an anxiety disorder in which health related anxiety is only one of several areas of excessive alarm, apprehension, and worry.

Though intense anxiety about illness is a hallmark of HC, it is not a specific feature unique to this disorder, raising the question of whether health anxiety is an independent entity at all. Patients with anxiety disorders (as in Generalized Anxiety Disorder [GAD] or Panic Disorder [PD]), Obsessive-Compulsive Disorder (OCD), or mood disorders may experience distressing somatic sensations and feel intense anxiety about physical health. This non-specificity has led to debate as to whether HC should be considered its own entity or thought of as a secondary feature of other disorders. A third possibility that has been considered, particularly in the older literature, is that HC is more closely related to mood disorder, and may in fact be a form of “masked” depression (1-4).

The classification of HC as anxiety disorder, depressive disorder, or somatoform disorder has important therapeutic implications. If HC is an anxiety disorder, one could have confidence in the expansion of cognitive explanatory models, cognitive therapies, and pharmacologic treatment of anxiety disorders to the treatment of HC (5-8). Evidence that selective serotonin reuptake inhibitors have therapeutic benefit in HC, and that relatively high doses are required for efficacy, may support categorization as an anxiety disorder rather than a disorder of somatization (9,10). Alternatively, if HC is primarily a disorder of cognitive schemas about disease and bodily sensations, the approach to formulation and treatment would need to be focused on these domains.

Several investigations have found that catastrophic thinking about bodily symptoms and overestimation of the risk of serious illness distinguishes HC from other anxiety disorders or OCD (11-17). The considerable overlap in manifestations of HC and PD has been addressed by studies showing that PD patients with HC, as compared to those without, have distinct

clinical characteristics (18) and prognosis (19). A study of patients with HC, non-HC DSM-IV somatoform disorders, and anxiety disorders, comparing both demographic and clinical characteristics, showed similarities and differences among the three groups and no clear indication that HC “belongs” with either the anxiety disorders or the somatoform disorders (2). Neuroimaging studies have shown the involvement of common neural circuits in HC, OCD, and panic disorder, without clear distinguishing features (20,21).

Patterns of co-morbidity are another way to distinguish among, and tease apart, independent but closely related disorders. If HC were most closely related to anxiety, or mood or somatoform disorders, one would expect a higher prevalence of other anxiety, mood or somatoform diagnoses in HC/IAD patients. The results of studies reporting on psychiatric co-morbidity in HC (14,22-24) and health anxiety in general (25) are notable for wide range in prevalence rates reported for comorbid axis I disorders. For example, prevalence of co-morbid Major Depressive Disorder ranges from 15% to 72%, and co-morbid Generalized Anxiety Disorder from 0% to 71%. Thus, there is no current consensus in the literature on the rate of co-morbidity of other psychiatric disorders in HC.

We wished to examine the relationship between DSM-IV HC and anxiety, somatoform, and mood disorders. Our primary purpose was to describe the rates of axis I comorbidity in individuals with HC, to determine to what extent HC occurs without any other axis I comorbid diagnoses, and to assess the association between hypochondriacal symptoms on the one hand, and anxiety and depressive symptoms on the other.

Material and Methods

Study Design and Procedures

Data analyzed for this report were collected between 2004 and 2009 as part of a randomized, controlled clinical trial of pharmacotherapy and cognitive behavior therapy for hypochondriasis that has not yet been published. An identical protocol was followed at the two participating institutions and was approved by both Institutional Review Boards. The study was conducted in the outpatient departments of the Brigham and Women's Hospital in Boston and the New York State Psychiatric Institute. All data were pooled at the New York site, which served as the data coordinating center.

Participants

The study population consisted of community dwelling respondents to advertisements asking “Do you worry about your health more than most people?” or “Do other people call you a hypochondriac?” Those exceeding a predetermined cutoff on a telephone screen for hypochondriacal symptoms completed a more thorough intake interview to establish eligibility. This included self-report questionnaires and a structured diagnostic interview. Participants were eligible if they were at least 21 years old, met criteria for DSM-IV hypochondriasis, had been free of psychoactive medications (except those given for non-psychiatric indications) for six weeks, and were fluent and literate in English. Exclusion criteria were the presence of major medical illness likely to worsen significantly during the study period, a physical or laboratory finding requiring medical attention, current use of a

medication that might interact with fluoxetine, pregnancy or nursing, diagnoses of schizophrenia, schizoaffective disorder, or bipolar disorder, current severe depression (as indicated by Beck Depression Inventory [BDI] > 30), current substance abuse or dependence, current high suicide risk based on initial interview, or previous treatment with cognitive-behavioral therapy or fluoxetine for hypochondriasis. Axis I comorbidity was allowed if hypochondriasis was the chief psychiatric concern. Participants were excluded if there was current involvement in symptom contingent litigation, disability proceedings, or worker's compensation proceedings. After complete description of the study to the participants, written informed consent was obtained.

Assessment

DSM-IV hypochondriasis was diagnosed with the Structured Diagnostic Interview for hypochondriasis (SDIH), an instrument demonstrated to have high validity (26,27). Point prevalence of comorbid psychiatric disorders were assessed with The Mini International Neuropsychiatric Interview Plus (MINI) (28,29).

Hypochondriacal symptoms were assessed with the Whitely Index, a 14-item self-report questionnaire with high reliability and validity (30-32). Anxiety symptoms were assessed with the Spielberger State-Trait anxiety inventory (STAI) state version (35). Depressive symptoms were assessed with the Beck Depression Inventory-II (BDI) (26,36,37). Somatization was assessed with the Patient Health Questionnaire 15 (PHQ-15), which also has high reliability and validity (33-34).

Sociodemographic information, including information on race, ethnicity, age, marital status, and employment status was also collected.

Statistical Analysis

Frequency distributions as well as means and standard deviations (for continuous variables) were assessed for each variable. Since missing values were < 1%, no missing values were imputed. To test differences in frequency distributions *Chi-square* tests were applied. To assess associations between continuous variables *Pearson correlations* were conducted. In order to test the magnitude of the dependent correlation coefficients against each other *t-statistics* were used. To assess the multivariate associations of anxiety, depression and somatization symptoms with hypochondriacal concerns, linear multiple regression analysis with forced entry was applied. Since there were significant differences between the populations at the two sites (New York center having higher rates of depression and obsessive compulsive disorder and Boston having higher rates of generalized anxiety disorder, somatization disorder, and pain disorder) the regression model was controlled for study center. *Tolerance values* > .2 and *variance inflation factors* < 10 indicated that the regression model did not seem to be biased by multicollinearity. All cases had a *Cooks' distance* far below 1, *Mahalanobis distance* below 15 and *standardized DFBbeta statistics* within +/-1, suggesting that there were no undue influential cases biasing the regression model and regression parameters. Graphical analysis confirmed the assumption of homoscedasticity. A *Durben-Watson-statistic* = 2.05 confirms the assumption of

independent errors for the regression model. All statistical tests were performed on an alpha level of .05. Data were analyzed with the Statistical Package for Social Sciences (SPSS 21).

Results

The sociodemographic characteristics of the study population are presented in Table 1. Notable is a relatively even distribution of men and women and a high proportion of single, never married individuals.

Frequency of diagnoses co-morbid with hypochondriasis is presented in Table 2. The mean number of co-morbidities was 1.4, and 64.9% of patients had at least one other DSM-IV diagnosis in addition to hypochondriasis. The single most common comorbid diagnosis was major depression (32.6%) and the prevalence of dysthymia was 14.0%. Anxiety disorders as a group were remarkably common (generalized anxiety disorder 28.5%, panic disorder 14.4%, agoraphobia 16.1%, PTSD and OCD each 12.9%), and despite major depression being the most common single comorbidity, anxiety disorders as a group were more common than depressive disorders as a group. Somatization disorder was found in 11.5% of patients.

We then examined a subsample composed of hypochondriacal patients with co-morbid mood disorder and no co-morbid anxiety disorder ("Depressive Cluster", $n = 28$) and a subsample with hypochondriasis with co-morbid anxiety disorder and no co-morbid mood disorder ("Anxiety Cluster", $n = 49$). The anxiety cluster was significantly larger than the depressive cluster ($\chi^2 [df=1] = 5.73, p = 0.017$). In comparison, there were only four patients (2%) whose only comorbidity was a somatoform disorder.

Table 3 shows correlation coefficients between continuous measures of symptoms rather than categorical diagnoses. Hypochondriacal concerns (assessed with the Whitely Index) are significantly associated with measures of depression, anxiety, and somatoform disturbance. The Whitely index is significantly more closely correlated with anxiety symptoms (assessed with the STAI state section) than with depressive symptoms (assessed with the BDI) ($t [df = 183] = -2.27, p < 0.05$), while the correlation of Whitely Index with somatization (assessed with the PHQ15) and with anxiety symptoms are not significantly different. Correlation of the Whitely Index with BDI is not significantly different than the correlation of Whitely index with PHQ15.

Multivariate associations of depressive symptoms, anxiety symptoms and somatization symptoms with health anxiety can be seen in Table 4. Controlling for site, the model containing all three independent variables predicted 29 % of the variance in the Whitely Index. The independent associations of the Whitely Index with anxiety symptoms and somatization symptoms were highly significant, while the association with depression was not statistically significant. The magnitude of association with anxiety was higher than that for somatization.

Discussion

These results suggest, given the high occurrence of HC in the absence of comorbidity, that HC is a primary disorder that can exist independent of other psychiatric disorders. Also, the data suggest that HC is more closely related to anxiety symptoms and anxiety disorders than to depressive symptoms and depressive disorders. Though major depression was the single most prevalent condition, anxiety disorders as a group were more prevalent than depressive disorder, and hypochondriacal participants were more likely to have only comorbid anxiety disorders than only comorbid depressive disorders. Similarly, while a continuous measure of hypochondriacal symptoms was positively correlated with measures of anxiety, depression, and somatization, the strength of correlation was significantly higher for anxiety than for mood, a result that held true under multiple regression analysis.

This casts doubt on historical formulations emphasizing the primary role of somatized depression in the pathogenesis of HC(1-4). Indeed, in multiple regression analysis, depressive symptoms were not significantly correlated with health anxiety once anxiety and somatization symptoms were accounted for, which suggests that while mood disturbance is a common co-morbidity with HC, the health worry itself is related to a disorder of anxiety rather than mood.

Similarly, the higher degree of correlation of health worry with anxiety, as opposed to somatization, suggests that health related worry, whether defined as HC as in DSM-IV or IAD as in DSM-5, might be better classified as an anxiety rather than a somatoform disorder. There is a practical value to the grouping in DSM-IV of HC with Somatization Disorder, as they both present with health-related concerns and are encountered predominantly in medical rather than mental health settings.. However, the primary goal of accurate diagnosis is effective intervention, and the nosological separation of a disorder from others that are phenomenologically similar may lead to suboptimal patient formulation and treatment planning.

These data also indicate that there is a substantial population of participants for whom health anxiety is the sole psychiatric diagnosis, as evidenced by the finding that one-third of the participants had no diagnosable axis I disorder other than HC (Table 3). This suggests HC is a distinct, primary disorder that can occur in the absence of any other condition. Notably, HC is distinct from other diagnoses in the somatoform disorders section of DSM-IV, given the low comorbidity rates of Somatization Disorder (11.5%), Pain Disorder (6.7%), and Body Dysmorphic Disorder (5.2%) (Table 2).

Our results confirm previous studies showing comorbid diagnoses in patients with HC are common (14,22,23). Rates of mood, anxiety, and somatoform disorders exceeded those that have been reported for the general population (36,37). As mentioned earlier, previous studies did not reach a consensus on comorbidity rates in HC, and our data do not clearly align with any one of those studies over another. The proportion of men and women in our sample was approximately equal. This gender distribution has been reported before in HC, but it is in contrast to that of most anxiety disorders and somatization disorder, which are more prevalent in women. This gender ratio is closer to that which is seen in OCD and Body

Dysmorphic Disorder, which is notable given the consideration to placing IAD with Obsessive Compulsive and Related Disorders in DSM5 (38,39).

The DSM-IV diagnosis of HC has been replaced by IAD and placed in the somatic symptom disorders section of DSM 5, not in the anxiety or mood disorders sections. While the continuous measure of hypochondriacal symptoms was, predictably, positively associated with somatization scores, the pattern of co-morbidity noted above suggests that it would be appropriately categorized as an anxiety disorder. It is prudent to note that the relationship between the diagnostic entities of DSM-IV HC and DSM-5 IAD is complex, as most patients meeting criteria for DSM-IV HC actually meet criteria for DSM5 Somatic Symptom Disorder and not IAD (37).

It is possible also that those people with illness anxiety, regardless of comorbidity, share certain underlying core psychological disturbances, such as neuroticism, and express a variable clinical phenotype. This highlights concerns that a dimensional, rather than categorical, approach to psychopathology may be preferred.

A limitation of this study is that the respondents with severe depression (as indicated by BDI > 30, or active suicidal ideation) were excluded. Thus, our data may underestimate the true prevalence of depressive disorders in patients with HC. The exclusion of patients on antidepressant and anxiolytic medication may have resulted in an underestimation of patients with comorbid anxiety and depressive disorders.

It is also worth noting that the DSM-IV diagnosis of somatization disorder uses stringent criteria, and as the presence of the often used DSM-IV diagnosis of undifferentiated somatization disorder was not assessed, the prevalence of comorbid somatic symptom disorders may be underestimated. The PHQ-15 may also be elevated in patients with true medical symptoms as opposed to somatization. Though our study excluded those with major medical illness at risk of worsening during the study and those with acute findings on physical or laboratory evaluation, elevation of this score in an individual due to minor medical illness cannot be excluded. Additionally, our recruitment method may have attracted individuals with some measure of insight, in that they were willing to participate in a study of HC. Our cohort differs from populations previously studied who were obtained by screening patients in ambulatory medical settings (14,22-25). Thus, it is possible that this study preferentially recruited people seeking help with the anxiety over their symptoms, rather than help with the symptoms themselves.

Another limitation is the lack of a comparison group and reliance on within-group correlation techniques. In investigating the question of placement of health anxiety as an anxiety or somatic symptom disorder, directly comparing the prevalence of other somatoform and anxiety disorders in a comparable control sample would be important, in order to determine if other Axis I disorders are co-morbid in a pattern that differs from non-HC patients. This would also be useful to investigate the proportion of patients with primary anxiety or depressive disorder and comorbid hypochondriasis.

Strengths of the study include the large sample size, the use of rigorous, standardized instruments for diagnosing psychiatric disorder and measuring symptoms, and the inclusion

of a medical morbidity assessment to rule out serious medical causes of the participants' somatic symptoms. Finally, the inclusion of participants from two different sites increases the generalizability of the findings.

It would be beneficial in future studies to compare a clinically identified cohort of patient with health anxiety to a matched control group to compare prevalence of co-morbid psychiatric disorders. Additionally, longitudinal studies of hypochondriacal patients, assessing whether co-morbidities are static over time or whether there is cross-over between anxious, somatoform, and depressive clusters would be of interest. Finally, there are identifiable groups of hypochondriacal patients with a variety of co-morbidities. This raises the possibility that, though health anxiety overall may be closely related to anxiety disorders, there may be individuals for whom there is a greater contribution of depressed mood or somatization to their health anxiety. Thus, the clinical and therapeutic importance of identifying patients as being related to an anxious, depressive, or somatoform subgroup is another area of potential research.

Conclusion

Our findings suggest that the entity of health anxiety, investigated in this study as the DSM-IV diagnosis of Hypochondriasis, is a clinical syndrome distinct from other psychiatric disorders and is more closely related to anxiety disorders than to depressive or somatization disorders.

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Table 1

Sociodemographic characteristics of patients with hypochondriasis Total n = 194.

Mean Age (SD)	39.8 (14)
Female f (%)	109 (56.2)
Mean Years of Education (SD)	15.4 (2)
Race (%)	
Caucasian	127 (65.5)
Black/African American (non-hispanic)	32 (16.5)
Asian	10 (5.2)
Other Race	25 (12.9)
Hispanic/Latino (%)	23 (11.9)
Marital Status (%)	
Single, never married	119 (61.3)
Married/Living with Partner	47 (24.2)
Divorced/Separated	26 (13.4)
Widowed	2 (1.0)
Unemployed, disabled, and/or on public assistance (%)	15 (7.7)

Table 2

Point prevalence of DSM-IV disorders in patients with hypochondriasis MD = Missing Data f = frequency.
Total n = 194

Diagnosis	f (%)
Generalized Anxiety Disorder	55 (28.5)
Panic Disorder (MD = 1)	28 (14.4)
Agoraphobia (MD=1)	31 (16.1)
Specific Phobia	28 (14.4)
Social Phobia	28 (14.4)
Major Depression (MD=1)	63 (32.6)
Dysthymia (MD=1)	27 (14.0)
Pain Disorder	13 (6.7)
Somatization Disorder (MD=2)	22 (11.5)
Body Dysmorphic Disorder (MD=3)	10 (5.2)
Post-Traumatic Stress Disorder (MD=1)	12 (12.9)
Obsessive Compulsive Disorder	25 (12.9)
No Other Axis I Diagnosis	68 (35.1)

Table 3

Pearson correlation between continuous measures of psychiatric symptoms in patients diagnosed with DSM-IV hypochondriasis, n=186.

	BDI	STAI	PHQ-15
Whitely Index	.384 [*]	.505 [*]	.400 [*]
BDI		.694 [*]	.443 [*]
STAI			.500 [*]

* $p < 0.001$. BDI = Beck Depression Inventory, STAI = State/Trait Anxiety Inventory, state version. PHQ-15 = Patient Health Questionnaire 15. Total n = 186.

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Table 4

Linear multiple regression model ($N = 189$) assessing the multivariate relationship of depression, anxiety, and somatization to hypochondriacal concerns, controlled for study center. BDI = Beck Depression Inventory, STAI = State/Trait Anxiety Inventory, state section. PHQ-15 = Patient Health Questionnaire 15. Total n

	<i>B</i>	<i>SE (B)</i>	β	<i>t</i>	<i>p</i>
BDI	0.01	0.08	.01	0.12	.907
STAI	0.28	0.06	.39	4.38	.000
PHQ15	0.40	0.16	.19	2.56	.011

Model summary: $R^2 = .29$, $R^2_{adjusted} = .28$, $F_{4,184} = 18.93$, $p = .000$